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Waste Management Industry Survey Business and Government Sectors 1998



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Symbols

The following standard symbols are used in Statistics Canada publications:

- .. figures not available
- ... figures not appropriate or not applicable
- nil or zero
- amount too small to be expressed
- x confidential to meet secrecy requirements of the *Statistics Act*

Preface

This report presents the results of the 1998 *Waste Management Industry Survey: Business Sector* and the 1998 *Waste Management Industry Survey: Government Sector*. These surveys gathered information on the financial characteristics and waste management activities undertaken by companies, local governments and other public waste management bodies.

These services included the collection and transportation of wastes and of materials destined for recycling, the operation of non-hazardous and hazardous waste disposal facilities, the operation of transfer stations and the treatment and disposal of wastes deemed to be hazardous.

The results of these surveys provide a picture of physical characteristics of waste disposal and recycling as well as financial and employment features of businesses and local governments that provide waste management services. The data have been analysed and presented at a provincial level wherever it was possible to do so without compromising confidentiality.

This is the fifth time that the business sector of the waste management industry has been surveyed and the sixth time that the local government sector has been covered. This is the second time that both sectors have been reported under one cover.

Acknowledgements

The contributions of the respondents, industry groups and provincial environmental departments were critical to the successful completion of the surveys and are gratefully acknowledged.

This report was prepared by the Environment Accounts and Statistics Division under the direction of Claude Simard, Director and Alice Born, Chief, Environmental Protection Accounts and Surveys. Data collection for the surveys was conducted by the Operations and Integration Division (Louis Boucher, Director) and the Environment Accounts and Statistics Division. Data from Public Institutions Division (Michel Girard, Director) were also used in the preparation of this report.

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1 Overview of the Waste Management Industry

1.1 Introduction

Waste statistics are important sets of information used to determine public policy and environmental practices. The Environment Accounts and Statistics Division of Statistics Canada plays a significant role in developing environmental statistics for Canada. One of the Division's objectives is to develop a complete set of statistics on the physical and financial dimensions of the management of waste.

The Canadian waste management industry embodies two inter-related elements - governments and other public organizations that provide or make provision for waste management services and private firms that supply these services. To supply the information needed to depict these two elements, two survey vehicles are utilized. One is the *Waste Management Industry: Business Sector Survey* and the other is the *Waste Management Industry: Government Sector Survey*. Both of these surveys gather financial and human resource (e.g., revenues, expenditures, employment) and physical (e.g., quantities of different types of waste disposed of or recycled) information about the waste management industry.

Waste management services undertaken by this industry include the collection and transportation of waste and materials destined for recycling or reuse, the operation of non-hazardous and hazardous waste disposal facilities, the operation of transfer stations, the operation of recycling facilities and the treatment of waste deemed to be hazardous.

Generally, there are two sources of waste management services. First, these services can be provided directly by a public body, such as a local government (e.g., city, town, regional district) or a waste management board or commission whose purpose is to co-ordinate the provision of such services. For example, a number of local governments may agree to jointly administer a landfill or a recycling facility (Text Box 1.1).

Private firms are a second source of these waste management services. Local governments may enter into contracts with these firms to provide certain waste management services or the businesses may directly enter into such arrangements with clients other than local governments. For example, a region may contract out curbside waste and/or recycling services to a company and this same company may enter into separate agreements with apartment complexes or industrial operations. The results from recent surveys indicate that there has been a shift from public production of waste management services to the contracting of these services to the private sector (Table 4.3). That is, more local bodies are foregoing the direct

Text Box 1.1

Local Government and Other Waste Management Services Providers

For the purposes of this report, local government in Canada includes all government and quasi-governmental entities below the provincial or territorial level. Within this broad category, administrative functions are divided among municipalities, special purpose boards and local school districts. A further distinction is made between upper and lower tier municipalities. In this report, for the purpose of simplicity, the term local government is used to denote any of the following public organizations.

Upper-tier municipalities are those encompassing one or more local government entities, such as metropolitan corporations, regional districts, regional municipalities and counties (in Ontario and Quebec).

Lower-tier municipalities are typically those whose borders can lie within or outside the jurisdiction of another level of municipality. These lower tier municipalities can include cities, towns, villages, townships, rural municipalities, districts and counties, and some quasi municipalities, including local government districts and local improvement districts.

Other public waste services providers can come in a variety of forms, but as a rule consist of a group of local municipalities (usually at the lower tier level) who collectively provide a waste management service. A group such as this will typically oversee the contracting out of a specific service or set of services (e.g., the operation of a materials recycling facility) but will also sometimes provide a service themselves (e.g., the operation of a landfill).

supply of waste management services and are instead contracting out more and more of these functions. The 1998 data indicate that this phenomenon is continuing.

A second major point to be made about this industry is one that addresses its structure. The waste management industry in Canada is one that is characterized by a small number of very large firms. The largest 59 companies in terms of employment account for only 4% of the total number of firms, yet 53% of total full and part-time employment (Tables 3.1 and 3.10) and 65% of total revenues (Table 3.1). There are 12% more companies in 1998 than there were in 1996 (Table 3.10). The concentration of revenues among the larger companies has remained stable during the same time period (Table 3.1). The number of larger firms has decreased slightly which

may indicate greater concentration among the larger businesses in the industry.

In 1998, operating revenues of the business sector of the industry totalled \$2.9 billion. Operating expenses amounted to \$2.5 billion and capital expenditures were \$319 million. The 1 606 companies in the industry employed 20 429 persons (full and part time) across Canada.

Local governments, waste management boards and other public waste management bodies had current expenditures dedicated to waste management services totalling \$1.3 billion in 1998 (Table 4.1). Thirty-seven percent of these expenditures was spent internally on the organization's own employees providing waste management services, 59% was paid to external contractors and 4% was allocated to other governments or government bodies providing these services (Table 4.2). Local governments and boards directly employed 6 890 persons (full and part-time) for the provision of waste management services (Tables 4.6 and 4.7).

There were over 20.8 million tonnes of non-hazardous waste materials disposed of in publicly or privately owned and/or operated landfill sites or incinerators. This translates to 690 kilograms of non-hazardous waste disposed of for each Canadian. This level was virtually unchanged from that in 1996 but it represents a decrease from 730 kilograms per capita in 1994 (Table 2.1).

Over 8.8 million tonnes of non-hazardous materials were diverted from disposal through recycling or reuse programs in 1998 (Table 2.4). Combined with those materials disposed, this translates to over 29 million tonnes of waste materials that were generated¹ and disposed of or recycled in off-site facilities in Canada during this year (Table 2.6). These include materials that were disposed of in landfills or incinerators plus materials that were diverted from disposal. Of these materials, 33% were generated from residential sources such as households and 67% from non-residential sources (Table 2.5).

On a per capita basis, the average waste generation in 1998 from both residential and non-residential sources was 0.98 tonnes for each Canadian, of which 0.69 tonnes were disposed of and 0.29 tonnes were diverted from disposal (Table 2.7).

Residential waste generation in Canada stood at 0.33 tonnes per capita in 1998 (Table 2.8). Disposal was calculated to be 0.23 tonnes while the residential sector diverted 0.10 tonnes or 30% of what it generated. British Columbia had the highest diversion rate at 41%, followed closely by Nova Scotia at 39%.

1. Generation includes only those materials that were disposed of or processed at off-site facilities. See Figure 1.1 and Section 2.3 for more information on what materials are included and what are excluded from these data.

1.2 Survey limitations

Results from the 1998 waste management industry surveys do not include the activities of wholesale trade companies whose *principal* source of revenue was the resale of recycled or previously used materials. This group includes scrap materials dealers as well as many other recyclers. Information on such activities is collected through the *Survey of Wholesale Trade*.

It is important to note that neither waste management survey covers waste or recyclable materials *directly* managed by the generator. For example, waste created by a pulp and paper mill or a smelter may be managed by the company on site or in another company-run facility without the assistance of separate service providers. Since the wastes have not entered the waste stream but have instead been disposed of or otherwise treated before entering the stream, these wastes are not included in the estimates contained herein. Some information in this regard may be available where particular wastes are subject to reporting requirements as part of specific provincial or federal regulatory programs. For example, the disposal of some hazardous wastes must be reported by the generating company to Environment Canada.

While Statistics Canada does not collect data on the amounts of waste managed directly by the *generating* businesses or governments, it does collect information on the expenditures that businesses incur to manage this waste through the *Survey of Environmental Protection Expenditures*². Estimates indicate that, in 1996, businesses spent \$588 million on the purchase of waste management and sewerage services³.

Finally, households often manage some waste materials themselves. Many households, for example, have backyard composters that handle at least a portion of home and garden organic waste. While the amounts of compostable materials handled through central composting programs are included in the report, the backyard component is not. Statistics Canada collected information on the number of households with backyard composting in the 1994 *Households and the Environment Survey*⁴.

Figure 1.1 illustrates the above points about survey coverage. The left portion (residential sector) of the figure shows that most, if not all of the waste and recyclables that are handled by public bodies and private waste management firms are captured by the surveys. Notable is the small portion of the materials in the residential sector

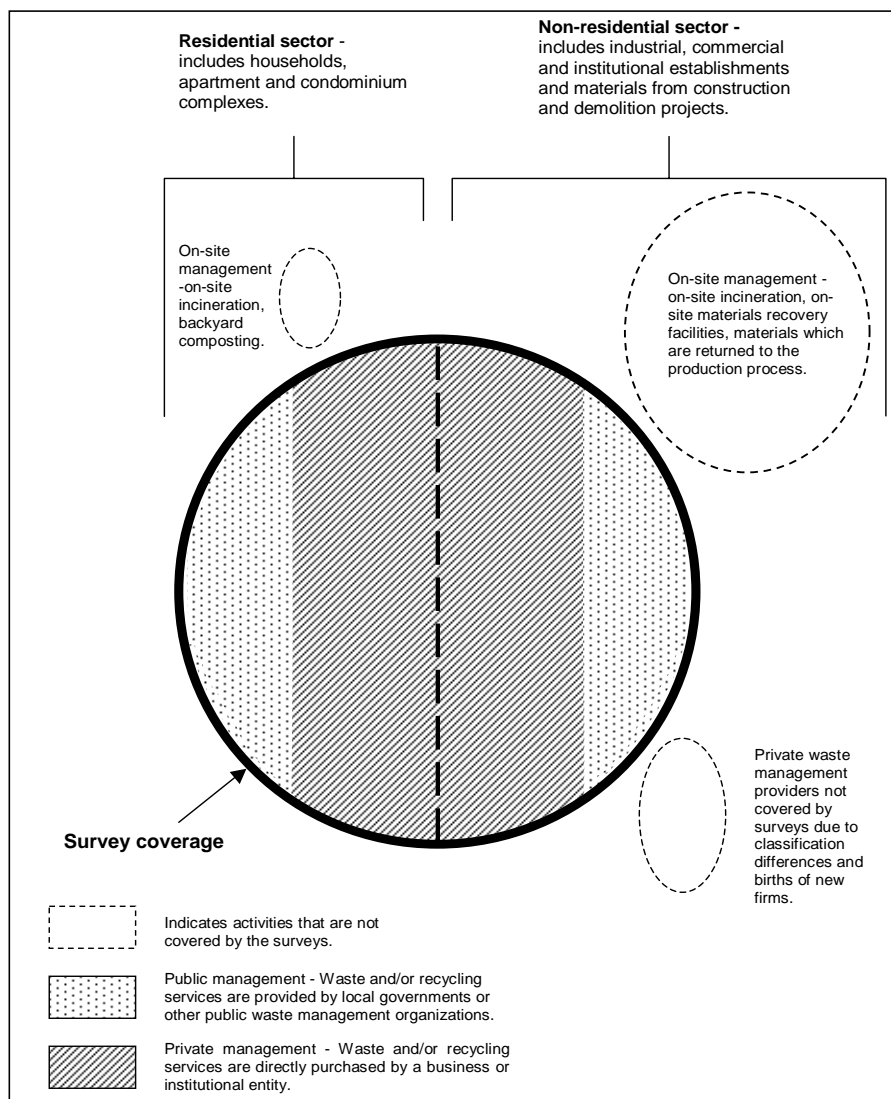
2. Statistics Canada, 2000, *Environmental Protection Expenditures in the Business Sector, 1996 and 1997 (revised)*, Item 16F0006XIE, Ottawa.

3. Includes primary industries (logging, mining, crude petroleum and natural gas), manufacturing, pipeline transportation, gas distribution and electric power industries.

4. Statistics Canada, 1995, *Households and the Environment, 1994*, Cat. 11-526, Ottawa.

Figure 1.1

A Perspective of the Waste Management Industry in Canada and Survey Coverage



Source:
Statistics Canada, Environment Accounts and Statistics Division.

that are managed on-site and consequently do not fall within the survey coverage.

The right part of the Figure diagrammatically represents the survey coverage for the non-residential portion of the waste stream. Compared to the residential portion, the survey coverage is not as complete. While the surveys do cover those municipalities who manage non-residential waste and the bulk of those private firms who engage in these activities, the surveys do not cover any of the on-site activities. It is not known what proportion of materials is handled on-site by the generator (the upper right circle), but it is anticipated that the amount is significant and that the bulk of these materials are from the industrial component of the non-residential sector. Various routes are being examined in order to better understand and estimate these quantities.

Also note that all waste or recyclable materials that are exported from Canada or imported into Canada are covered by the surveys. Due to issues of confidentiality, however, these data are not published in this report.

It is also expected that there is a sub-segment of the private sector that carries out waste management activities but is not covered by the surveys. This is mainly due to classification difficulties and/or the entry of new firms into the industry that have not yet been classified.

1.3 Defining waste and its components

Waste management activities take many different forms and involve many different participants. This presents challenges when trying to prepare an integrated picture of activities, including the total materials managed.

One common thread is that all the materials handled are *unwanted by their producer*. The unwanted materials may be by-products of a production process—fly ash from a furnace, for example. Alternatively they might be products, the inherent value of which has been consumed from the perspective of the current holder—for example, a newspaper that has been read or a package that has been opened and emptied of its contents.

Concepts and definitions in the waste management area have been evolving over the past several years. The most common source of difficulty is in classifying types of waste. Strategies to compile waste statistics reflect the specific needs of statistical and analytical projects: by type (municipal solid non-hazardous waste, hazardous waste); by generator or by generating activity (residential, industrial, commercial, institutional and construction and demolition projects) as well as by type of material. The differences in the terminology that the various respondents use can create many operational difficulties when surveys are in the field. In conducting the 1996 *Waste Management Industry Survey: Business Sector*, valuable suggestions were made by survey respondents on how to refine the classifications and this was taken into account while developing the 1998 edition of the questionnaire (see Text Box 1.3 for definitions). In addition, progress is being made on both the national and international fronts toward the development and implementation of consistent classifications and measurement methodologies of waste management industry activities as well as the materials that this industry handles (see Section 5.6).

This report provides information on the physical tonnages, types and sources of waste and recyclable materials. It also looks at specific financial and employment characteristics of the business sector and the local government sector of the waste management industry. Finally, an explanation and outline of the surveys' design is presented, as well as some notes on the methodology that was used to derive the estimates.

Text Box 1.2

Nunavut - Canada's Newest Territory

On April 1, 1999 the territory of Nunavut was officially established through the Nunavut Land Claim Agreement and the Nunavut Act.

The data presented in this Report do not reflect the 1999 Nunavut boundaries since all data refer to the period before April 1, 1999. Therefore, where data on the Northwest Territories are shown, these data refer to the **Northwest Territories (including Nunavut), as defined before April 1, 1999.**

Text Box 1.3

Definitions**Construction and demolition waste (C&D)**

Includes waste materials from the construction and demolition of roads, bridges and buildings such as asphalt, concrete, rubble, wood, gypsum and metal.

Disposal facility

A facility at which waste is landfilled, incinerated or treated for final disposal.

Generation

Total generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an *off-site* disposal facility and the total materials processed for recycling at an *off-site* recycling facility.

Hazardous waste

Includes all materials designated as hazardous, due to their nature or quantity, and requiring special handling techniques as specified by legislation or regulation.

Institutional, commercial and industrial (IC&I) waste

Includes materials from sources such as heavy and light industry, manufacturing, warehousing, transportation, retail and wholesale commercial activities, restaurants, offices, educational or recreational facilities, health and other service facilities.

Materials for recycling or reuse

Materials managed for processing into new products or cleaned and treated for reuse by other than the generator

Preparing materials for recycling or reuse

Includes sorting, cleaning and reducing volume of recyclable or reusable materials.

Recycling

Recycling is the process whereby a material (e.g., glass, metal, plastic, paper) is diverted from the waste stream and remanufactured into a new product or is used as a raw material substitute.

Residential waste

Includes solid waste from residential sources which includes all households and includes waste that is picked up by the municipality (either using its own staff or through contracting firms) and waste from residential sources that is taken by the generator to depots, transfer stations and disposal facilities.

Non-residential waste

Includes municipal solid non-hazardous waste generated by industrial, commercial and institutional sources as well as waste generated by construction and demolition activities.

Sanitary landfill

At a minimum, this is a landfill that accepts only specified waste and has controls in place (such as fencing and personnel) to monitor the types and quantities of waste that are placed in it. Often this term also denotes those landfills that have systems in place to separate waste and its leachate from the water table or to draw off leachate for treatment and disposal.

Tipping fee

A sum paid to the owner or operator of a disposal facility or a transfer station in return for accepting the material at the facility.

Transfer station

A facility at which wastes transported by vehicles involved in collection are transferred to other vehicles that will transport the wastes to the point of final disposal, recycling or reuse.

Waste

All materials unwanted by their generator. This includes all materials that are intended for recycling, treatment or disposal that are removed without, or with only nominal, remuneration to the waste generator.

Waste for disposal

All materials not wanted by their generator and which are discarded for management at waste disposal facilities (excludes materials destined for recycling).

2 Waste Disposal and Material Recycling

This chapter presents information on the quantities of non-hazardous waste and recyclable materials managed in Canada in 1998. It also discusses diversion and generation by sector as well as the methodologies employed in developing these estimates.

2.1 Off-site disposal of waste

Non-hazardous waste

Seven hundred and sixty-seven local government and privately owned and/or operated landfills¹ and 45 incinerators received 20.8 million tonnes of non-hazardous waste in 1998, up slightly from 1996 (Tables 2.1 and 2.2). This represented 690 kilograms per capita, a level that is virtually unchanged from that in 1996. From 1994 to 1998, non-hazardous waste disposal per capita has dropped by over 5%.

1. This figure represents an increase in the number of landfills over the reference period. Part of the reason for this increase is due to the survey methodology used to assemble the data for this report. Many of the smaller municipalities in Canada, especially in Ontario, were not previously surveyed because they did not meet the population threshold that was used to determine inclusion or exclusion from the survey frame. Due to municipal amalgamations that have occurred in some provinces, the populations of the combined municipalities (which were previously excluded from the survey) increased substantially and were now included in the survey frame. Hence, many smaller landfills, not previously surveyed, were captured in the 1998 survey.

On a provincial basis, Nova Scotia had the lowest per capita quantity of non-hazardous waste disposed of in the country (0.54 tonnes per capita) while Alberta had the highest (0.87 tonnes per capita). From 1996 to 1998, Nova Scotia had the highest per capita percentage drop in Canada (9%), followed by New Brunswick (8%) and Saskatchewan (6%). The provinces who saw the greatest decreases in non-hazardous waste disposed of per capita from 1994 to 1998 include Nova Scotia (29%), Newfoundland (20%), and British Columbia (20%). Manitoba saw a slight increase in non-hazardous waste disposal per capita. However, this increase is likely due to the disposal of non-hazardous waste from the Red River floods into landfills.

Data on exports and imports of non-hazardous waste cannot be published due to issues of confidentiality.

One hundred and eighty-one of the landfills had on-site weigh scales. Most of these landfills accepted a variety of non-hazardous waste, including municipal waste, construction and demolition waste and other types of non-hazardous waste (Table 2.2).

Table 2.1
Disposal of Waste¹ by Province and Territory, 1998

Province/Territory	Waste disposed			Waste disposed per capita		
	1994	1996	1998	1994	1996	1998
	tonnes					
Newfoundland	486 523	372 324	366 280	0.84	0.67	0.67
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	713 941	553 638	502 577	0.76	0.59	0.54
New Brunswick	576 102	505 957	468 571	0.76	0.67	0.62
Quebec ²	5 189 400	5 491 000	5 537 465	0.71	0.75	0.75
Ontario	7 350 586	6 913 786	6 988 157	0.67	0.62	0.61
Manitoba	951 142	947 884	964 726	0.84	0.84	0.85
Saskatchewan	925 121	900 210	848 408	0.91	0.88	0.83
Alberta	2 329 327	2 435 884	2 527 817	0.86	0.88	0.87
British Columbia	2 791 478	2 413 528	2 458 484	0.76	0.62	0.61
Yukon and Northwest Territories ³	x	x	x	x	x	x
Canada	21 464 714	20 673 903^r	20 840 883	0.73	0.69	0.69

Notes:

Figures may not add up to totals due to rounding.

r revised figures

1. Total amount of waste disposed of in public and private waste disposal facilities. Does not include waste disposed of in hazardous waste disposal facilities nor waste managed by the waste generator on site.

2. Figures are derived from the results of complementary surveys conducted by the province.

3. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 2.2
Non-hazardous Waste Disposal Site Characteristics by Province and Territory, 1998

Province/Territory	Type of disposal			Type of waste accepted ¹		
	Incinerators	Landfills	Landfills with weigh scales number of facilities	Municipal ²	Construction and Demolition	Other ³
Newfoundland	x	34	x	53	23	9
Prince Edward Island	x	x	x	x	x	x
Nova Scotia	4	22	12	23	20	5
New Brunswick	-	10	x	9	8	x
Quebec ⁴	..	139	..	..	..	..
Ontario	3	187	60	181	152	49
Manitoba	-	63	x	62	43	14
Saskatchewan	-	78	x	76	53	17
Alberta	x	121	40	118	80	30
British Columbia	10	96	37	97	78	35
Yukon and Northwest Territories ⁵	-	x	x	x	x	x
Canada	45	767	181	481	408	143

Notes:

- Number of facilities that accept waste from the specified sources.
- Municipal solid non-hazardous waste includes solid non-hazardous waste produced by the residential and the industrial, commercial and institutional sectors and excludes construction and demolition waste.
- Other non-hazardous waste includes mixed non-hazardous waste and that which could not be classified by the survey respondents.
- Figures are derived from the results of complementary surveys conducted by the province.
- Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 2.3
Non-hazardous Waste Disposed of by Source and by Province and Territory, 1998¹

Province/Territory	Residential	Industrial, commercial and institutional	Construction and demolition	Other	Total	
					1996	1998
					tonnes	
Newfoundland	x	210 313	x	-	372 324	366 280
Prince Edward Island	39 225	x	x	-	x	x
Nova Scotia	183 231	271 249	x	x	553 638	502 577
New Brunswick	182 970	242 656	x	x	505 957	468 571
Quebec ²	2 076 754	2 881 038	566 194	13 480	5 491 000	5 537 465
Ontario	2 526 581	3 692 281	733 507	35 788	6 913 786	6 988 157
Manitoba	277 686	577 980	x	x	947 884	964 726
Saskatchewan	286 716	493 984	x	x	900 210	848 408
Alberta	616 270	1 258 006	611 493	42 048	2 435 884	2 527 817
British Columbia	707 729	1 341 228	408 211	1 316	2 413 528	2 458 484
Yukon and Northwest Territories ³	x	x	x	x	x	x
Canada	7 057 117	11 040 800	2 626 383	116 583	20 673 903^r	20 840 883

Notes:

Figures may not add up to totals due to rounding.

r revised figures

- Sources of waste disposed of derived from reported sources of non-hazardous waste collected and transported for disposal.
- Figures are derived from the results of complementary surveys conducted by the province.
- Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Non-hazardous waste by source

Fifty-three percent of non-hazardous waste disposed of came from industrial, commercial and institutional sources. Residential, and construction and demolition sources accounted for 34% and 13% of total non-hazardous waste respectively (Table 2.3). The industrial, commercial and institutional sector was the largest source of non-hazardous waste in all provinces.

Hazardous waste

Six hundred and four thousand tonnes of hazardous waste were treated and disposed of in Canada in 1998. Environment Canada reports that 276 thousand tonnes of hazardous waste were exported from Canada and 540 thousand tonnes were imported¹.

2.2 Off-site material recycling

Types of materials

Over 8.8 million tonnes of materials were prepared for recycling or reuse in 1998. Thirty-eight percent of these materials were processed in Quebec while Ontario's share was 31%. Paper products (including newsprint, boxboard and old corrugated cardboard) comprised 33% of the national total, ferrous metals such as iron and steel made up 18% and construction and demolition materials, including bricks and drywall accounted for 18% (Table 2.4 and Text Box 2.1).

Data on exports and imports of materials for recycling were gathered but cannot be published due to issues of confidentiality.

Central composting

Over 1.1 million tonnes of organic materials were composted in central off-site facilities in 1998. Organics made up 12% of the total materials processed for recycling. Sixty-six percent of these materials were prepared in Ontario, while 16% and 13% were processed in Quebec and British Columbia respectively (Table 2.4 and Text Box 2.2).

Sources of recyclable materials

Sixty-seven percent of all materials collected and transported for recycling or reuse originated from non-residential sources (Table 2.5). Nova Scotia saw the highest proportion of these materials come from residential sources (58%) while Quebec had the largest non-residential proportion (87%).

1. Environment Canada, Transboundary Movement Division, 1999, *Resilog* June 1999, Volume 12, No. 2.

Text Box 2.1

Notes on Recycling Data

- **Quebec recycling and disposal data**

The province of Quebec administers their own survey programs to collect physical data on waste disposal and material recycling. There are some methodological differences between the data published by the province of Quebec and by Statistics Canada. While some similarities are present in terms of definitions of waste and recycling, there are some dissimilarities. Therefore, it must be noted that any inter-provincial comparisons with regard to data from Quebec should be made with caution. This caution should be exercised when using data from the tables in Chapter 2. Table 5.3 shows information on the reliability of data within specific tables.

- **Inclusion and exclusion of data**

These recycling data include those materials that were processed for recycling or reuse at publicly or privately owned material recycling facilities. These data do not include those materials that were processed by a business or public body on site as part of its production process (e.g., steel at a foundry or paper at a pulp and paper mill) or as part of a secondary economic activity. Consequently, it is expected that some of the recycling that is performed by the industrial sector is underestimated in the data contained herein.

Text Box 2.2

Notes on Composting Data

For 1998, these data include those centralized programs that are operated by public waste management organizations such as local governments or waste management boards or commissions as well as those facilities that are privately owned and operated. They do not include estimates for non-centralized composting programs such as backyard composting bins. These data provide more coverage than the 1996 data since private facilities were not covered in that year. Hence, caution should be exercised in making comparisons of quantities of materials composted from 1996 to 1998.

Table 2.4
Materials Prepared for Recycling or Reuse by Type and by Province and Territory, 1998¹

Type of Materials	Nfld.	P.E.I.	N.S.	N.B.	Que. ³	Ont.	Man.	Sask.	Alta.	B.C.	Y.T. and N.W.T. ⁴	Canada
tonnes												
Newspprint	1 386	x	90 296	15 823	..	401 020	83 812	4 906	64 001	156 012	x	818 303
Cardboard and boxboard	x	x	23 722	25 218	..	186 157	30 259	7 219	51 015	301 816	x	644 884
Mixed paper	x	x	x	12 988	777 800 ⁵	463 082	x	x	31 836	135 024	x	1 453 356
Glass	-	x	17 610	x	101 000	104 836	27 727	x	42 766	35 523	-	361 453
Ferrous metals	x	x	9 442	x	915 500	283 360	142 058	x	x	39 277	x	1 604 422
Copper and aluminum	x	x	x	x	..	27 936	6 036	x	x	23 265	-	71 430
Other metals	506	-	820	2 421	107 070	37 534	27 017	2 142	2 371	18 209	-	198 090
Plastics	4 071	2 143	12 020	11 944	23 265	24 889	8 474	3 531	3 078	20 022	-	113 437
Bricks and drywall	x	-	5 098	-	..	38 621	-	x	-	62 835	-	106 561
Construction and demolition	x	227	24 675	4 116	1 156 900 ⁶	219 430	-	550	x	81 721	-	1 492 901
Oils and solvents	x	-	8 165	x	..	20 618	-	x	x	12 107	x	336 637
Organics	x	x	16 751	x	174 500	723 687	x	x	5 814	141 305	-	1 100 286
Other materials ²	1 203	681	6 807	x	67 600	233 991	2 827	33 091	21 397	102 933	x	508 512
Total	40 928	x	217 676	141 665	3 350 870	2 765 160	332 516	275 552	540 340	1 130 049	x	8 810 272

Notes:

Figures may not add up to totals due to rounding.

1. This information covers only those companies and local waste management organizations that reported material preparation activities.

2. Other materials include tires, textiles, contaminated soil and whitegoods.

3. Figures are derived from the results of complementary surveys conducted by the province.

4. Includes Nunavut.

5. Includes all paper materials.

6. Includes all construction and demolition materials as well as bricks and dry wall.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 2.5
Non-hazardous Materials Prepared for Recycling or Reuse by Source and by Province and Territory, 1998¹

Province/Territory	Residential sources ²	Non-residential sources ³	Total
tonnes			
Newfoundland		x	40 928
Prince Edward Island		x	x
Nova Scotia	127 227	90 449	217 676
New Brunswick	64 023	77 642	141 665
Quebec ⁴	435 613	2 915 257	3 350 870
Ontario	1 309 705	1 455 455	2 765 160
Manitoba	144 209	188 307	332 516
Saskatchewan	99 279	176 273	275 552
Alberta	216 788	323 552	540 340
British Columbia	503 898	626 151	1 130 049
Yukon and Northwest Territories ⁵	x	x	x
Canada	2 936 566	5 873 704	8 810 272

Notes:

Figures may not add up to totals due to rounding.

1. Sources of materials for recycling or reuse are derived from reported sources of materials collected and transported or prepared for recycling.

2. Residential non-hazardous materials include solid non-hazardous materials produced in all residences and include non hazardous materials that are picked up by the municipality (either using its own staff or through contracting firms) and non-hazardous materials from residential sources that is self-hauled to depots, transfer stations and disposal facilities.

3. Non-residential sources include municipal solid non-hazardous materials generated by industrial, commercial and institutional sources as well as materials generated by construction and demolition activities.

4. Figures are derived from the results of complementary surveys conducted by the province.

5. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

2.3 Off-site non-hazardous material generation and diversion

Measurement issues

For the first time, Statistics Canada is publishing data on total materials diverted from disposal. Diversion generally refers to material which has avoided disposal through a combination of processes and actions, and refers to activities which handle the waste in such a way that it is not disposed of.¹

However, it must be noted that these generation and diversion figures should be used with some caution². They are a **proxy** for total waste generation and diversion in Canada.

First, as with the recycling and disposal data, **these figures include only those materials that were processed for recycling or reuse at publicly or privately owned material recycling facilities**. These data do not include those materials that were processed and reused by a business or public body on site as part of its production process and never enter the non-hazardous waste stream (i.e., they are not “unwanted” by the producer, for example, steel at a foundry) or as part of a secondary economic activity. While the proportion of on-site activities versus off-site activities is not known, preliminary results from the 1997 *Survey of Environmental Protection Expenditures* indicate that purchases of waste management services accounted for about one-third of the total amount of purchased services made by businesses.

Second, it is acknowledged that data from a large portion of the “reuse” category are not included in these tables. For example, used clothing that is donated to a retailer and re-sold is excluded.

Third, these data do not include those materials managed by wholesalers of scrap metal, plastics or paper. As with the other survey data in this report, the data cover only those firms whose primary source of income accrues from waste management activities.

Fourth, the agricultural sector is largely excluded from these data. Waste and recyclable materials (e.g., dead livestock, manure) from farms are generally managed on-site by the producer or managed by firms who specialize in the management of agricultural waste. Most of these

1. GAP Team, June 15, 2000, *Manual on Generally Accepted Principles (GAP) for Calculating Municipal Solid Waste Flow. Development of a Methodology for Measurement of Residential Waste Diversion in Canada, Draft*. Toronto, p. 15. Section 5.6 provides more information on the GAP initiative.

2. See Section 5.4 on data quality

Text Box 2.3

Measuring Generation and Diversion

- Generation = Diversion + Disposal + (Exports-Imports)
- Diversion = Recycling + Composting + Reuse
- Diversion Rate = Diversion/Generation x 100 (%)

The recycling and composting portions of diversion are covered in Tables 2.4 and 2.5 (*Non Hazardous Materials Prepared for Recycling or Reuse*). However, as noted previously, these data only include those materials processed by firms and governments that carry out waste management activities and exclude a number of reuse activities.

Discussions are underway both at the national (GAP waste flow discussions) and the international (North American Product Classification System initiative) levels to standardize the methodologies and definitions used in the calculations of waste flows and in the way one defines the products that the waste management industry produces. Through these efforts, the formulae presented above will be more completely reflected in future survey results. Many of the definitions and concepts that have been used in these two initiatives have been applied to this Report.

businesses are not classified as part of the waste management industry as defined by the North American Industry Classification System (NAICS).³

Finally, the province of Quebec conducts its own local government waste management surveys. There are differences in the methodologies that are used to estimate waste and recycling between those employed by Statistics Canada in this report and those used by the Province of Quebec.

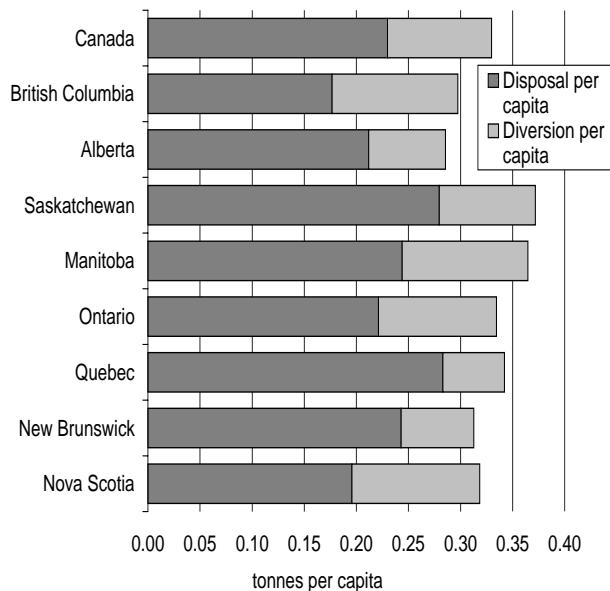
Generation and diversion

Over 29 million tonnes of non-hazardous waste generated in Canada were managed off-site in 1998 (Table 2.6). These include materials that were disposed of in off-site landfills or incinerators and materials that were diverted from disposal by an outside waste management services provider (Text Box 2.3).

Of these materials, 33% were generated from residential sources such as households and 67% from non-residential sources such as industrial operations, institutions, commercial establishments and construction and demolition projects. Among the provinces, the residential share of total generation was highest in Nova Scotia, at

3. Text Box 5.1 provides more information on NAICS.

Figure 2.1
Non-hazardous Waste Disposal and Diversion, Residential Sources, Selected Provinces, 1998



Note: Data for some provinces/territories are confidential and are not shown in this figure.
Source: Statistics Canada, Environment Accounts and Statistics Division

41%, while Alberta experienced the lowest proportional share at 27% (Table 2.6).

Total tonnage of materials generated is a good starting point to begin looking at diversion data, but by examining the data on a *per capita* basis, a better picture can be drawn of Canadian non-hazardous waste generation, disposal and diversion characteristics (Table 2.7).

The average non-hazardous waste generation in 1998 from both residential and non-residential sources was 0.98 tonnes for each Canadian, of which 0.69 tonnes were disposed of and 0.29 tonnes were diverted from disposal (including both incinerators and landfills). Newfoundland saw the lowest per capita quantity generated (0.75) Nova Scotia generated the next lowest quantity (0.77), followed by New Brunswick (0.81). Manitoba was at the other end of the scale with 1.14 tonnes per capita generated in 1998. However, the Manitoba figure may be misleading since many of the waste materials that were generated as a result of the Red River floods are included in these data.

Quebec reported the highest per capita diversion figures (0.36 tonnes), followed by British Columbia (0.29 tonnes) and Manitoba (0.29 tonnes).

**Text Box 2.4
 Residential and Non-Residential Waste Measurement**

Isolating and measuring residential non-hazardous waste generation and diversion as opposed to combining both the residential and non-residential sector data is a more accurate approach to identifying waste diversion tendencies.

A per capita measurement based on waste coming from non-residential and residential sources is problematic since it applies a measure (per capita) that is not easily correlated with the amount of non-hazardous waste produced in the non-residential sector. For example, it is misleading to correlate the output of non-hazardous waste from the manufacturing sector with a number that represents the general population. A waste quantity per number of employees or per dollar of revenue would be a better measure for the non-residential sector.

Survey respondents, especially those in the business sector, find it very difficult to identify and report from where waste and recyclables originate. Often, materials can be picked up from both residential and non-residential sources on the same pick-up route. Thus, an alternate method was used in estimating the residential and non-residential shares of non-hazardous waste and recyclable materials. For the business sector, the splits were derived from using the proportion of revenues derived through contracts with governments, households, industrial, commercial and institutional (ICI) clients, and construction and demolition (C & D) projects. Survey respondents from the local government sector were asked to indicate whether the materials originated from residential, ICI or C & D sources.

The proportions were then scrutinized by comparing them to external information on the sources of various recyclable materials or quantities of materials from specific sectors¹. Generally, the use of the revenue source proxy resulted in proportions that approximated those presented on a material-type basis. Adjustments to the calculated proportions were made where necessary.

The resulting proportions were then applied to the reported total tonnages of non-hazardous waste or recyclable materials for each respondent and the result is the residential, non-residential split seen in several of the tables in this chapter.

1. See for example: Recyc-Québec, 1999, *Gestion des matières résiduelles au Québec, Bilan 1998*; Ontario Ministry of the Environment, 1999, *Municipal 3Rs in Ontario: 1998 Fact Sheet*; Government of Alberta, 1997, *Waste Material Sources and Composition*, <http://gov.ab.ca/env/waste/aow/sources.html> (accessed August 3, 2000).

From these data, a per capita diversion rate was calculated by dividing the per capita diversion figure by the per capita generation number. British Columbia showed the highest rate of diversion among all of the provinces with 32% of all non-hazardous waste generated per capita being diverted from disposal. Both Quebec and Nova Scotia saw 30% diverted.

The data in Table 2.7 include all materials from all sources (residential and non-residential) covered by the surveys. When the data from residential and non-residential sources

are separated and the residential sector is more closely examined, a different picture emerges.

Table 2.8 and Figure 2.1 show per capita disposal, diversion and generation levels from residential sources only (see Text Box 2.4). Residential non-hazardous waste generation in Canada stood at 0.33 tonnes per capita in 1998. Disposal was calculated to be 0.23 tonnes while the residential sector diverted 0.10 tonnes or 30% of what it generated. British Columbia had the highest diversion rate at 41%, followed closely by Nova Scotia at 39%.

Table 2.6
Quantity of Municipal Solid Non-Hazardous Waste and Recyclable Materials Generated, by Source, by Province and Territory, 1998

Province/Territory	Residential sources ¹	Non-residential sources ²	Total generation ³
	tonnes		
Newfoundland	x	x	407 208
Prince Edward Island	x	x	115 883
Nova Scotia	298 362	421 891	720 253
New Brunswick	235 639	374 597	610 236
Quebec ⁴	2 512 367	6 375 968	8 888 335
Ontario	3 821 558	5 931 758	9 753 317
Manitoba	415 288	881 954	1 297 242
Saskatchewan	381 510	742 450	1 123 960
Alberta	831 297	2 236 860	3 068 157
British Columbia	1 191 493	2 397 040	3 588 533
Yukon and Northwest Territories ⁵	x	x	78 031
Canada	9 925 556	19 725 598	29 651 154

Notes:

Figures may not add up to totals due to rounding.

1. Residential waste includes solid waste produced by the residential sources which includes all residences and includes waste that is picked up by the municipality (either using its own staff or through contracting firms) and waste from residential sources that is self-hauled to depots, transfer stations and disposal facilities.

2. Non-residential sources include municipal solid non-hazardous waste generated by industrial, commercial and institutional sources as well as waste generated by construction and demolition activities.

3. Total generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an off-site disposal facility and the total materials processed for recycling at an off-site recycling facility.

4. Figures are derived from the results of complementary surveys conducted by the province.

5. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 2.7
Quantity of Municipal Solid Non-Hazardous Waste and Recyclable Materials Generated, Disposed of, and Diverted per Capita, all Sources, by Province and Territory, 1998

Province/Territory	Disposal ¹ per capita	Diversion ² per capita	Generation ³ per capita	Rate of diversion per capita
	tonnes			percent
Newfoundland	0.67	x	x	x
Prince Edward Island	x	x	x	x
Nova Scotia	0.54	0.23	0.77	30
New Brunswick	0.62	0.19	0.81	23
Quebec ⁴	0.75	0.36	1.21	30
Ontario	0.61	0.24	0.85	28
Manitoba	0.85	0.29	1.14	26
Saskatchewan	0.83	0.27	1.10	25
Alberta	0.87	0.18	1.05	17
British Columbia	0.61	0.29	0.90	32
Yukon and Northwest Territories ⁵	x	--	1.15	--
Canada	0.69	0.29	0.98	30

Notes:

1. Total amount of waste disposed of in public and private waste disposal facilities. Does not include waste disposed of in hazardous waste disposal facilities nor waste managed by the waste generator on site.

2. Diversion is the quantity of materials diverted from disposal and represents the sum of all materials processed for recycling or reuse at an off-site recycling facility.

3. Total generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an off-site disposal facility and the total materials processed for recycling at an off-site recycling facility.

4. Figures are derived from the results of complementary surveys conducted by the province.

5. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 2.8

Quantity of Municipal Solid Non-Hazardous Waste and Recyclable Materials Generated, Disposed of, and Diverted per Capita, Residential Sources, by Province and Territory, 1998

Province/Territory	Disposal ¹ per capita	Diversion ² per capita tonnes	Generation ³ per capita	Rate of diversion per capita percent
Newfoundland	x	x	x	x
Prince Edward Island	x	x	x	x
Nova Scotia	0.20	0.12	0.32	39
New Brunswick	0.24	0.07	0.31	22
Quebec ⁴	0.28	0.06	0.34	17
Ontario	0.22	0.11	0.33	34
Manitoba	0.24	0.12	0.36	33
Saskatchewan	0.28	0.09	0.37	25
Alberta	0.21	0.07	0.28	26
British Columbia	0.18	0.12	0.30	41
Yukon and Northwest Territories ⁵	x	--	x	--
Canada	0.23	0.10	0.33	30

Notes:

1. Total amount of non-hazardous residential solid waste disposed of in public and private waste disposal facilities. Does not include waste disposed of in hazardous waste disposal facilities nor waste managed by the waste generator on site.
2. Diversion is the quantity of materials diverted from disposal and represents the sum of all residential materials processed for recycling at an off-site recycling facility.
3. Total generation is the sum of total non-hazardous residential solid waste disposed of in an off-site disposal facility and total residential materials processed for recycling or reuse at an off-site recycling facility.
4. Figures are derived from the results of complementary surveys conducted by the province.
5. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

3 Business Sector: Financial and Employment Characteristics

This chapter presents a number of financial and employment statistics for the business sector of the waste management industry in Canada in 1998. These include revenues (as well as revenue sources), capital and operating expenditures, employment and what type of waste management activities that waste management firms engage in.

3.1 Revenues

Revenues of the business sector of the waste management industry totalled \$2 879 million in 1998. This translates to a 8% growth rate from 1996 levels. Businesses operating in Ontario reported \$1 357 million in revenues, 47% of the national operating revenues of the business sector of the waste management industry. Quebec reported an additional 20% of the total. British Columbia had the third highest revenue level (13%), closely followed by Alberta (10%).

The waste management industry is concentrated in the hands of a relatively small number of large firms. The 59 largest businesses (those with 50 or more employees) reported 65% of the total revenue although they accounted for only 4% of the total number of businesses in the industry. The 1 433 small firms (under 20 employees)

accounted for only 22% of the revenues (Tables 3.1 and 3.2).

Details on waste management revenues by type of activity for the surveyed businesses are presented in Table 3.2. Collection and transportation activities, both for disposal and for recycling or reuse, were the largest source of revenues for the business sector of the waste management industry. Fifty-six percent of total revenues came from this source. The second ranking activity, in terms of revenue generated, was the operation of a disposal facility. This activity accounted for about 12% of revenues. The preparation of materials for recycling or reuse and the operation of waste transfer facilities generated respectively 10% and 9% of waste management revenue.

On a provincial basis, at least 54% of total business operating revenues were reported to be derived from waste collection and transportation (disposal plus recycling or reuse) in all provinces except Prince Edward island (48%). The highest proportions of revenues from this source were reported in Newfoundland and Nova Scotia (71% and 64% respectively).

When examining the firm size groups, one finds that the small businesses, as a group, had a higher proportion of their total revenues derived from the operation of disposal facilities (16%) than did the other business size groups

Table 3.1
Waste Management Industry: Business Sector Characteristics by Province and Territory, 1998

Province/Territory	Businesses ¹ number	Total employees ²	Operating expenses	Capital expenditures	Operating revenues		
					1995	1996	1998
thousand dollars							
Newfoundland	42	345	14 657	2 315	23 322	22 430	18 799
Prince Edward Island	10	x	10 944	x	x	x	4 912
Nova Scotia	86	740	54 620	10 825	49 763	50 424	63 632
New Brunswick	81	438	39 610	5 829	30 945	35 820	43 398
Quebec	548	5 153	528 349	90 754	704 912	607 066	586 196
Ontario	397	7 912	1 161 136	116 732	1 128 298	1 318 298	1 357 171
Manitoba	45	419	49 713	9 238	36 697	48 704	80 093
Saskatchewan	42	420	33 935	4 996	22 694	19 314	45 850
Alberta	133	2 038	252 941	41 870	275 195	257 148	292 052
British Columbia	265	2 746	323 405	34 787	316 688	293 813	381 303
Yukon and Northwest Territories ³	12	x	4 153	x	x	x	5 099
Employment size group							
Under 20 employees	1 433	6 187	580 112	94 219	572 495	569 259	662 014
20 to 49 employees	114	3 344	338 724	48 778	388 433	312 369	353 648
50 and more employees	59	10 898	1 554 626	176 324	1 643 387	1 780 425	1 862 841
Canada	1 606	20 429	2 473 462	319 320	2 604 315	2 662 053	2 878 503

Notes:

Figures may not add up to totals due to rounding.

1. As businesses may operate in more than one province the national count will not equal the sum of the provincial count of businesses.

2. Includes full and part-time employees.

3. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.2
Operating Revenues of Waste Management Businesses by Activity and by Province and Territory¹, 1998

Province/Territory	Collection and transportation for disposal	Collection and transportation for recycling or reuse	Operation of a waste transfer facility	Preparation of materials for recycling or reuse	Operation of a disposal facility	Operation of a hazardous waste facility	Sewage treatment	Sale of recovered materials	Other waste management revenues	Total revenues	
										1996	1998
thousand dollars											
Newfoundland	10 493	2 816	960	1 691	1 049	91	10	373	1 315	22 430	18 799
Prince Edward Island	1 935	438	x	x	x	x	x	x	x	x	4 912
Nova Scotia	36 174	4 586	6 277	5 981	7 046	620	38	1 906	1 005	50 424	63 632
New Brunswick	21 612	3 097	4 418	6 923	3 361	1 367	101	1 845	674	35 820	43 398
Quebec	267 724	50 959	38 835	43 431	88 072	57 868	3 479	24 696	11 131	607 066	586 196
Ontario	613 950	146 450	151 760	137 927	135 109	49 473	1 056	22 926	98 519	1 318 298	1 357 171
Manitoba	29 566	14 251	2 818	14 840	9 911	x	x	547	6 013	48 704	80 093
Saskatchewan	19 395	9 150	2 742	10 360	2 924	x	x	482	288	19 314	45 850
Alberta	137 035	26 583	15 871	21 008	40 942	x	x	10 422	3 484	257 148	292 052
British Columbia	181 881	32 933	27 920	40 602	51 951	11 443	386	16 393	17 794	293 813	381 303
Yukon and Northwest Territories ²	4 027	39	x	x	x	x	..	x	x	x	5 099
Employment size group											
Under 20 employees	328 243	55 501	48 512	45 826	107 002	16 438	1 977	27 050	31 466	569 259	662 014
20 to 49 employees	162 674	43 889	25 760	55 077	19 920	16 158	3 284	11 291	15 597	312 369	353 648
50 and more employees	832 875	191 913	177 469	182 316	215 855	127 322	347	41 519	93 225	1 780 425	1 862 841
Canada	1 323 792	291 302	251 740	283 219	342 777	159 917	5 608	79 860	140 288	2 662 053	2 878 503

Notes:

Figures may not add up to totals due to rounding.

1. Includes administrative data for businesses that were below the survey threshold for inclusion.

2. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.3
Waste Collection and Transportation Activities of Businesses by Source of Revenue and by Province and Territory, 1998

Province/Territory	Source of revenue				
	Governments	Households	Industrial, commercial and institutional	Construction and demolition projects	Other
percent					
Newfoundland	13	15	57	14	..
Prince Edward Island	27	12	54	7	..
Nova Scotia	12	25	54	9	1
New Brunswick	15	24	52	7	2
Quebec	12	26	52	10	..
Ontario	20	16	53	10	1
Manitoba	18	11	60	10	1
Saskatchewan	12	22	58	8	..
Alberta	14	11	50	24	2
British Columbia	14	15	55	17	..
Yukon and Northwest Territories ¹	16	18	53	13	1
Canada	16	18	53	13	1

Notes:

Figures may not add up to totals due to rounding.

1. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

(12% and 6% respectively for large and medium sized businesses) (Table 3.2). By contrast, the opposite is true of hazardous waste facility management. Only 2% of small business revenues were derived from this source, compared to 7% for large firms and 5% for medium-sized businesses. This may be explained by the large capital investments required for the management of certain types

of hazardous wastes. Access to this capital may be difficult for smaller businesses.

Revenue sources

The majority of revenues from the collection and transportation of waste came from institutional, commercial and

industrial (IC&I) clients, (53%) while 18% of collection and transportation revenues came from households and 16% from governments (Table 3.3). Recyclables collection and transportation activities saw a similar pattern with 58% of revenues coming from IC&I clients, 16% from households and 19% from local governments (Table 3.4).

With the exceptions of those in Newfoundland and Nova Scotia, firms that processed materials for recycling or reuse accrued the bulk (55%) of their revenues from IC&I sources (Table 3.5).

3.2 Waste management activities

Waste management businesses provide a variety of different services (Table 3.6). The collection and transportation of waste for disposal and of materials for recycling or reuse were the primary activities reported by the industry. Seventy-three percent of the waste management firms reported waste collection and transportation activities (for disposal) while 57% reported that they collected and transported materials for recycling or reuse. The operation of a MRF or other type of recyclables preparation facility was another activity reported frequently (18%), followed by the operation of a landfill (12%).

Table 3.4
Recyclables Collection and Transportation Activities of Businesses by Source of Revenue and by Province and Territory, 1998

Province/Territory	Source of revenue				Other
	Governments	Households	Industrial, commercial and institutional percent	Construction and demolition projects	
Newfoundland	11	21	54	14	-
Prince Edward Island	14	17	62	8	-
Nova Scotia	33	8	50	8	1
New Brunswick	21	12	56	11	..
Quebec	26	18	47	9	..
Ontario	17	16	60	6	1
Manitoba	7	5	85	3	-
Saskatchewan	12	7	77	4	-
Alberta	15	31	49	6	..
British Columbia	19	12	61	8	..
Yukon and Northwest Territories ¹	23	13	44	12	7
Canada	19	16	58	7	..

Notes:

Figures may not add up to totals due to rounding.

1. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.5
Recyclables Preparation Activities of Businesses by Source of Revenue and by Province and Territory, 1998

Province/Territory	Source of revenue				Other
	Governments	Households	Industrial, commercial and institutional percent	Construction and demolition projects	
Newfoundland	8	56	29	7	..
Prince Edward Island	9	25	59	8	..
Nova Scotia	25	25	36	14	..
New Brunswick	5	28	62	5	..
Quebec	18	23	48	12	..
Ontario	22	14	49	11	4
Manitoba	5	8	83	4	..
Saskatchewan	9	10	75	6	..
Alberta	12	16	67	6	..
British Columbia	20	12	59	6	3
Yukon and Northwest Territories ¹	..	..	..	..	..
Canada	18	16	55	9	2

Notes:

Figures may not add up to totals due to rounding.

1. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.6
Frequency of Waste Management Activities Conducted by Businesses by Province and Territory, 1998^{1,2}

Province/Territory	Activities reported								
	Collection and transportation for disposal	Collection and transportation for recycling or reuse	Operation of a waste transfer facility	Preparation of materials for recycling or reuse	Operation of a landfill for non-hazardous waste	Operation of an incinerator for non-hazardous waste	Sewage treatment	Operation of a hazardous waste facility	Other activity
	percentage of businesses reporting activity								
Newfoundland	86	43	7	14	7	7	-	-	14
Prince Edward Island	75	75	-	25	25	25	-	-	25
Nova Scotia	87	79	8	39	5	5	-	-	11
New Brunswick	75	54	21	39	7	-	7	7	7
Quebec	69	42	12	18	20	3	8	9	18
Ontario	74	66	28	45	9	2	2	4	13
Manitoba	60	70	20	50	20	-	10	10	-
Saskatchewan	74	63	21	37	11	-	5	-	16
Alberta	71	61	33	39	18	-	-	10	27
British Columbia	71	62	17	38	19	5	2	6	12
Yukon and Northwest Territories ³	x	29	-	-	29	-	-	14	14
Employment size group									
Under 20 employees	73	54	7	12	12	2	2	4	13
20 to 49 employees	78	64	24	31	6	3	8	8	21
50 and more employees	71	70	29	43	21	2	5	14	20
Canada	73	57	6	18	12	2	3	5	15

Notes:

1. This table presents the percentage of businesses reporting each of the indicated waste management activities. As companies may perform more than one activity, the percentages will not sum to 100.

2. This information covers only those businesses that were surveyed.

3. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.7
Number of Waste Management Activities Reported by Businesses by Province and Territory, 1998¹

Province/Territory	Activities reported				
	One	Two	Three	Four	Five or more
	percentage of businesses				
Newfoundland	21	42	38	-	-
Prince Edward Island	-	25	75	-	-
Nova Scotia	9	42	31	5	13
New Brunswick	14	29	27	21	9
Quebec	24	32	19	7	19
Ontario	11	33	28	19	9
Manitoba	18	24	35	24	-
Saskatchewan	13	33	10	27	17
Alberta	13	24	12	12	38
British Columbia	13	33	29	21	4
Yukon and Northwest Territories ²	-	29	13	19	40
Employment size group					
Under 20 employees	19	37	25	14	6
20 to 49 employees	7	27	25	11	29
50 and more employees	7	17	20	24	32
Canada	15	33	24	15	14

Notes:

Figures may not add up to totals due to rounding.

1. This table presents, by province and by firm size, businesses classified by the number of waste management activities that they conduct. This is expressed as a percentage of the total number of businesses.

2. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Smaller and medium-size firms tended to focus on collection and transportation activities, especially for disposal (73% and 78%, respectively). Further, larger businesses reported higher involvement in the collection and transportation of recyclables (70%) than did the small or medium-size firms (Table 3.6).

While Tables 3.2 and 3.4 point out some relationships between the size of a firm and the specific types of activities upon which firms of a particular size may concentrate on, looking at the *number* of activities undertaken also brings out some interesting patterns.

In many industries, larger businesses are generally more horizontally or vertically integrated across a number of activities that make up the industry's production process. For example, many engineering firms offer a set of services that offer the customer "one-stop shopping" for the needs of a particular project. The waste management industry is no different. The size of a firm appears to have a bearing on the number of waste management activities that are performed by the business. Overall, 86% of all businesses reported carrying out more than one waste management activity and 29% reported four or more activities. But among small firms, 19% reported only one operation while only 20% reported four or more activities. In contrast, only 7% of the large firms indicated just one activity while 56% reported four or more activities (Table 3.7).

3.3 Operating and capital expenditures

Operating expenditures

From 1996 to 1998, total operating expenditures of the waste management businesses fell by almost 2%. A breakdown of these expenses is shown in Table 3.8. At the national level, wages and salaries and tipping fees paid to waste disposal facilities were the largest components of expenses (both 24%), followed by maintenance and repairs (12%). This distribution is similar to the pattern seen in 1996.

In 1998, tipping fees expenses and wages and salaries were the largest expenses for all provinces, with tipping fees surpassing wages and salaries in 4 provinces. Tipping fee expenses as a proportion of total expenses ranged from a high of 30% in Nova Scotia to a low of 19% in Newfoundland.

Tipping fees were the highest operating expenses for the large businesses, (26%) while wages and salaries followed close behind (21%). Medium-sized firms saw 30% of their total operating expenses go to salaries and wages, while only 18% were allocated to tipping fees. The small firms directed 29% of their total operating expenses to wages and salaries and 24% to tipping fees.

Capital expenditures

Waste management firms invested over \$319 million in capital in 1998 (Table 3.9). There are marked variations between levels of capital expenditures across the provinces. With an average of \$331 thousand per firm, firms operating in Alberta reported the highest level of capital expenditures per business, with businesses in Ontario (\$304 thousand) following close behind. Firms operating in New Brunswick (\$72 thousand) and Newfoundland (\$58 thousand) had the lowest levels of capital expenditures per business.

Waste management businesses directed the largest proportion of capital expenditures towards machinery and equipment (34%) and vehicles (33%). This was true of firms in all size categories (Table 3.9).

Table 3.8
Operating Expenditures of Waste Management Businesses by Type and Province and Territory¹, 1998

Province/Territory	Wages and salaries	Benefits	Fuel and electricity	Other materials and supplies	Maintenance and repairs	Depreciation	Tipping fees	Operating licences and permits	Other expenses	Total operating expenditures	
										1996	1998
	thousand dollars										
Newfoundland	5 407	598	884	1 317	1 155	1 293	2 827	208	967	22 999	14 657
Prince Edward Island	2 647	x	1 056	x	929	x	614	44	x	10 367	10 944
Nova Scotia	14 996	1 500	2 576	4 461	5 835	3 995	16 325	431	4 503	56 033	54 620
New Brunswick	11 263	862	2 525	3 880	3 229	3 732	9 218	405	4 496	43 335	39 610
Quebec	150 347	19 149	27 816	49 622	60 403	44 714	117 316	6 894	52 088	564 337	528 349
Ontario	254 556	33 800	94 809	103 440	158 678	77 090	298 838	28 755	111 169	1 230 158	1 161 136
Manitoba	11 133	1 313	1 961	4 195	5 093	3 510	12 829	288	9 391	41 439	49 713
Saskatchewan	10 886	961	1 652	4 459	3 646	3 062	6 865	427	1 976	20 289	33 935
Alberta	64 525	8 050	11 790	21 196	26 179	31 476	49 451	1 621	38 653	238 262	252 941
British Columbia	77 647	9 478	11 991	42 847	32 665	23 845	84 874	6 154	33 902	281 324	323 405
Yukon and Northwest Territories ¹	1 674	x	262	x	486	x	97	51	x	3 836	4 153
Employment size group											
Under 20 employees	170 953	13 075	33 617	31 880	49 584	47 835	138 106	5 897	89 166	580 674	580 112
20 to 49 employees	102 980	10 240	17 737	41 928	27 559	24 660	60 442	5 111	48 068	297 168	338 724
50 and more employees	331 148	52 779	105 970	163 549	221 155	122 315	400 707	34 271	122 731	1 634 537	1 554 626
Canada	605 081	76 094	157 323	237 357	298 298	194 810	599 254	45 279	259 965	2 512 379	2 473 462

Notes:

Figures may not add up to totals due to rounding.

1. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.9
Capital Expenditures¹ of Waste Management Businesses by Type and by Province and Territory, 1998

Province/Territory	Vehicles	Other machinery and equipment	Construction and refurbishing of facilities	Maintenance and repairs	Other	Total capital expenditures		Average capital expenditures per business	
						1996	1998	1996	1998
thousand dollars									
Newfoundland	746	573	567	374	54	1 965	2 315	45	58
Prince Edward Island	131	x	x	x	x	x	x	x	x
Nova Scotia	4 630	2 697	2 378	515	605	3 932	10 825	52	137
New Brunswick	2 314	1 679	885	772	180	6 085	5 829	98	72
Quebec	33 810	26 886	21 267	4 044	4 747	66 887	90 754	131	170
Ontario	37 173	44 202	21 003	5 485	8 869	90 249	116 732	242	304
Manitoba	2 267	1 491	5 135	206	139	4 173	9 238	123	217
Saskatchewan	1 713	1 914	619	569	180	1 666	4 996	50	138
Alberta	9 737	16 324	10 662	4 730	416	28 892	41 870	263	331
British Columbia	11 668	12 951	3 435	5 469	1 264	41 252	34 787	196	136
Yukon and Northwest Territories ²	46	x	x	x	x	x	x	x	x
Employment size group									
Under 20 employees	37 734	29 772	12 584	9 537	4 592	62 527	94 219	49	65
20 to 49 employees	15 672	17 209	11 085	3 331	1 481	42 398	48 778	499	436
50 and more employees	50 829	62 988	42 743	9 360	10 403	159 284	176 324	2 528	2 891
Canada	104 235	109 970	66 412	22 228	16 475	264 209	319 320	184	197

Notes:

Figures may not add up to totals due to rounding.

1. Includes administrative data for businesses that were below the survey threshold.

2. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

On average, large firms allocated \$2.9 million to capital expenditures, while the average capital expenditure level of small firms reached \$65 thousand. Small firms tended to direct more of their capital expenditures to vehicles (40%) than the large or medium-size businesses (29% and 32% respectively).

3.4 Employment and number of businesses

Over 20 thousand persons were employed by waste management businesses in 1998 (Table 3.10). This represents a 6% increase from 1996 employment levels. The total number of businesses showed an increase from 1996 to 1998, but much of this increase can be attributed to an increasingly large number of small players in the industry and changes to the coverage of the survey.¹

Waste management businesses reported 19 117 full-time and 1 312 part-time employees (Table 3.11). Thirty-nine percent of the total in the industry was employed by firms in Ontario while 25% of the total worked in Quebec. British Columbia (13%) and Alberta (10%) also had relatively

substantial shares of the total business sector waste management employment.

Although there were fewer large waste management firms than small and medium-size ones, they employed most of the sector's labour force (53%). By contrast, the small firms, despite making up 89% of the total number of firms in the sector, employed only 30% of the private sector work force.

The bulk of the employees worked in the operation of the firm rather than in another capacity. Interestingly, smaller firms had a slightly higher proportion of full and part-time administrative and management workers (19%) than did the large (18%) or medium-size (16%) businesses (Table 3.11).

1. Firms that fell below the revenue or employment threshold for inclusion in the 1998 survey frame were imputed using information from Statistics Canada's Business Register. In recent years, the Business Register has been expanding its coverage to include smaller businesses. Thus, more firms are included in the imputed portion of the waste management statistics.

Table 3.10

Employment by Waste Management Businesses by Province and Territory, 1995, 1996 and 1998

Province/Territory	Businesses			Total employees ²		
	1995 ¹	1996 ¹	1998 ¹	1995	1996	1998
	number					
Newfoundland	42	44	42	288	283	345
Prince Edward Island	14	11	10	129	134	x
Nova Scotia	83	76	86	648	630	740
New Brunswick	60	62	81	314	406	438
Quebec	519	509	548	5 542	5 086	5 153
Ontario	385	373	397	6 936	7 731	7 912
Manitoba	36	34	45	293	375	419
Saskatchewan	39	33	42	277	255	420
Alberta	109	110	133	1 939	1 865	2 038
British Columbia	222	211	265	2 487	2 455	2 746
Yukon and Northwest Territories ³	11	12	12	55	56	x
Employment size group						
Under 20 employees	1 321	1 285	1 433	5 788	5 619	6 187
20 to 49 employees	106	85	114	3 215	2 880	3 344
50 and more employees	65	63	59	9 904	10 852	10 898
Canada	1 492	1 433	1 606	18 908	19 351	20 429

Notes:

Figures may not add up to totals due to rounding.

1. As businesses may operate in more than one province or territory, the national totals will not equal the sum of the provincial totals.

2. All employment estimates obtained from administrative data were counted as full-time employees.

3. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

Table 3.11

Employment by Waste Management Businesses by Function and by Province and Territory, 1998

Province/Territory	Businesses	Full-time employees			Total ² full-time	Part-time employees			Total employees	
		Administration Operations and management	Other	Total ² full-time		Administration Operations and management	Other	Total part-time		
	number									
Newfoundland	42	120	40	75	235	73	17	20	110	345
Prince Edward Island	10	x	x	x	84	x	-	-	x	x
Nova Scotia	86	552	108	25	685	48	x	x	55	740
New Brunswick	81	280	75	22	377	28	14	14	56	438
Quebec	548	3 885	733	71	4 689	379	56	40	475	5 153
Ontario	397	5 920	1 428	266	7 614	287	52	11	350	7 912
Manitoba	45	307	x	x	411	x	x	-	x	419
Saskatchewan	42	339	53	15	407	x	x	x	18	420
Alberta	133	1 496	418	53	1 967	60	x	x	75	2 038
British Columbia	265	1 915	478	216	2 609	97	25	22	144	2 746
Yukon and Northwest Territories ³	12	x	x	-	39	x	x	x	x	x
Employment size group										
Under 20 employees	1 433	4 392	1 041	154	5 587	445	107	48	600	6 187
20 to 49 employees	114	2 330	516	176	3 022	286	25	11	322	3 344
50 and more employees	59	8 193	1 897	418	10 508	276	50	64	390	10 898
Canada	1 606	14 915	3 454	748	19 117	1 007	182	123	1 312	20 429

Notes:

Figures may not add up to totals due to rounding.

1. As businesses may operate in more than one province or territory, the national totals will not equal the sum of the provincial totals.

2. All employment estimates obtained from administrative data were counted as full-time employees.

3. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

4 Government Sector: Financial¹ and Employment Characteristics

This chapter presents information on local governments and other public bodies (e.g., waste management boards) who provide waste management services. These data include current expenditures and to whom these expenditures are allotted, capital expenditures, revenues and employment characteristics.

4.1 Current and capital expenditures

Category of expenditure

Table 4.1 provides a summary of current expenditures on waste management activities made by local governments and other waste management local authorities. These expenditures totalled over \$1 278 million in 1998.

Fifty percent of these current expenditures went to the collection and transportation of waste, recyclables and

organic materials. The operation of disposal facilities was the second largest expenditure item, accounting for 27% of the total, followed by tipping fees paid to other local governments or private waste management firms (10%).

Local governments providing waste management services in Ontario accounted for 39% of current expenditures while those in Quebec made up 26% of the national total. In 1996, the targets of these expenditures varied widely across the country, reflecting the diversity of waste services funding and operational arrangements that exist in Canada. For example in 1996, from Quebec to Alberta, collection and transportation activities were the dominant expenditures items. However, those local governments in New Brunswick, Nova Scotia and British Columbia allocated the highest proportion of their waste management expenditures to the operation of disposal facilities. But in 1998, only local governments in New Brunswick allocated their highest proportions of expenditures to the operation of disposal facilities rather than to collection and transportation activities.

1. Local waste management authorities provide a number of services that are funded from either tax revenues or non-tax revenues. The financial information contained in the following chapter only addresses those revenues that were accrued from sources *outside* the tax base and exclude provincial and territorial transfers.

Table 4.1
Local Government Current Expenditures on Waste Management by Activity and by Province and Territory¹, 1996 and 1998

Province/Territory	Collection and transportation		Tipping fees		Operation of disposal facilities		Operation of recycling facilities		Operation of organics processing facilities		Other		Total	
	1996	1998	1996	1998	1996	1998	1996	1998	1996	1998	1996	1998	1996	1998
	thousand dollars													
Newfoundland	5 078	5 050	x	x	2 779	x	x	x	-	-	x	x	8 600	9 798
Prince Edward Island	2 037	921	x	x	x	-	-	x	x	x	-	x	x	x
Nova Scotia	12 660	26 625	608	900	23 783	10 943	9 439	2 898	551	618	8 449	8 098	55 489	50 082
New Brunswick	4 205	6 445	2 903	7 245	6 549	14 955	x	x	-	x	1 544	3 409	15 384	33 215
Quebec ²	139 480	163 770	28 576	34 680	90 646	88 402	22 352	21 115	3 727	5 348	22 811	17 197	307 592	330 512
Ontario	198 614	262 091	43 310	56 340	92 710	104 219	35 374	43 505	6 318	10 764	22 499	26 472	398 826	503 391
Manitoba	16 069	17 194	5 582	5 812	8 027	7 820	1 055	392	x	x	x	x	31 230	31 680
Saskatchewan	10 099	10 792	981	244	4 424	5 829	615	1 656	x	x	x	x	16 246	18 612
Alberta	48 812	55 028	6 966	6 951	16 439	21 999	x	x	x	x	10 602	1 430	87 963	88 695
British Columbia	61 188	83 602	12 501	20 974	78 328	82 730	6 151	7 906	1 783	3 168	15 528	9 544	175 478	207 924
Yukon and Northwest Territories ³	2 310	1 885	-	-	x	x	x	x	x	x	x	x	x	x
Canada	500 553	633 403	102 549	134 129	325 302	341 906	80 215	81 667	15 157^r	20 685	81 863	66 511	1 103 856	1 278 300

Notes:

Figures may not add up to totals due to rounding.

r revised figures

1. Includes current expenditures directed toward waste management services.

2. Total is derived from a complementary survey conducted by Public Institutions Division, breakdowns are imputed or are derived from administrative sources.

3. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division and Public Institutions Division.

With the exception of the "Other" category, each of the expenditure items saw an increase from their 1996 levels, with the operation of organics facilities leading the way with a 36% overall increase from the previous period. In general, tipping fee expenditures (the weight-based fees that are paid to the owner or operator of a landfill facility for the right to deposit waste in that facility) also increased significantly from 1996 to 1998 with the highest increases seen in New Brunswick and British Columbia. Local governments in Saskatchewan reported a large decrease in this expenditures category.

Service providers

Table 4.2 shows who are the ultimate providers of local government waste management services. For 1996 and 1998, these were divided into three categories: in-house employees, contractors and other governments. Nationally in 1998, 59% of waste management expenditures were paid for services provided by contractors, 37% were allocated to waste management services performed by the local government's own employees, and 4% were paid out to other government bodies providing these services. This compares to 54%, 42% and 4% respectively for 1996.

On a provincial basis, the move to contracted services was most pronounced in Nova Scotia. In 1996 only 21% of the expenditures were paid to private firms for waste management services, but by 1998, this proportion had jumped to 57%. A large increase in contracted-out waste

management services was also seen in British Columbia. New Brunswick and Manitoba both saw shifts away from contracted provision to in-house provision.

A comparison between the 1994 and 1996 allocations of waste management services and the 1998 allocation is shown in Table 4.3. While in 1994, the own employees/contractors split was even, 1996 data suggest that more local waste management authorities were contracting out to the private sector for the provision of these services and 1998 data have confirmed this trend.

Overall, the largest shift has been in the collection and transportation of waste or recyclable materials. In 1994, 45% of waste management expenditures allocated to collection and transportation activities came from in-house employee activities. By 1996, only 39% of these expenditures were for collection and transportation operations run by in-house personnel, while 61% were spent on contracted services. In 1998, the provider of these services is increasingly the private sector with 69% of these expenditures paid to contractors. Also notable is the shift to the contracted out provision of disposal facility services. From 1994 to 1998, local waste management authorities have shifted 7% of their total expenditures in this category from in-house employees to contracted services.

Despite the shift to private provision of waste collection and waste disposal services, these data indicate that public bodies are retaining the ownership and/or the operation of recycling facilities. A reason for this could be that recycling

Table 4.2
Local Government Current Expenditures on Waste Management by Service Provider and by Province and Territory, 1998

Province/Territory	Current expenditures ¹		Service provider ²					
			Own employees ³		Contractors		Other government	
	1996	1998	1996	1998	1996	1998	1996	1998
	thousand dollars		percent					
Newfoundland	8 600	9 798	69	69	26	28	5	3
Prince Edward Island	x	x	x	x	x	x	x	x
Nova Scotia	55 489	50 082	77	41	21	57	2	2
New Brunswick	15 384	33 215	44	61	44	37	11	3
Quebec ⁴	307 592	330 512	19	15	81	85	..	n/a
Ontario	398 826	503 391	46	42	49	51	5	7
Manitoba	31 230	31 680	63	71	36	28	1	1
Saskatchewan	16 246	18 612	75	75	24	24	..	..
Alberta	87 963	88 695	60	62	37	36	3	2
British Columbia	175 478	207 924	43	34	49	57	8	8
Yukon and Northwest Territories ⁵	x	x	x	x	x	x	x	x
Canada	1 103 856	1 278 300	42	37	54	59	4	4

Notes:

- 1. Current expenditure figures are preliminary and cover surveyed municipalities. Current expenditures cover collection and transport of waste for disposal or recyclables/organics, tipping fees, disposal facilities, organics processing facilities and other waste management expenditures.
- 2. Columns indicate percentage of current expenditures spent on programs delivered by own employees versus payments to contractors or other governments or government bodies for services.
- 3. Full-time and part-time employees working in the waste management activities of the municipality. Employment figures are only for surveyed municipalities. They do not include estimates of waste management employment in municipalities with less than 4000 population unless a disposal facility is situated within it.
- 4. Total current expenditures are derived from a complementary survey conducted by Public Institutions Division. The expenditure breakdowns and number of employees are imputed or are derived from administrative sources.
- 5. Includes Nunavut.

Sources:

Statistics Canada, Environment Accounts and Statistics Division and Public Institutions Division.

Table 4.3

Local Government Current Expenditures on Waste Management by Service Provider and Activity, 1994, 1996 and 1998¹

Activity	1994		1996			1998		
	In-house employees	Contractors	In-house employees	Contractors	Other governments ²	In-house employees	Contractors	Other governments ²
					percent			
Collection and transportation	45	55	39	61	-	31	69	-
Tipping fees	..	..	18	51	32	16	51	32
Disposal facilities	59	41	48	51	1	50	48	2
Recycling facilities	38	62	37	62	1	48	51	1
Organics processing facilities	..	..	47	53	-	42	58	-
Other activity ³	50	50	73	26	1	58	39	3
All	50	50	42	54	4	37	59	4

Notes:

1. Proportion of current expenditure by service provider includes estimates for surveyed municipalities, as well as estimates for municipalities that were not surveyed.

2. The 1996 and 1998 *Waste Management Industry Survey: Government Sector* included the Other Governments category. This category would be generally covered in the Contractors category in the 1994 data.

3. Tipping fees and organics processing facilities were included in Other activity category in 1994.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

facilities may (depending on market conditions) generate significant revenue from the sales of processed recyclable feedstock. Thus, a municipality or waste management board may be reluctant to give up this revenue generating activity to a private sector firm.

Local governments in Ontario and Quebec invested the largest amounts on waste management capital expenditures (\$54 million and \$36 million respectively) followed by British Columbia (\$17 million), Alberta (\$17 million) and New Brunswick (\$13 million).

Capital expenditures

Local government waste management services were responsible for capital expenditures of over \$193 million in 1998 (Table 4.4). Disposal facilities accounted for 67% of this sum while collection and transportation made up 13%.

4.2 Revenues

Total non-tax revenues collected by local governments or other waste management public authorities amounted to over \$712 million in 1998 (Table 4.5). This represents an increase of 12% since 1996. Of the 1998 total, 56% was

Table 4.4

Capital Expenditures by Local Governments on Waste Management Services by Activity and by Province and Territory¹, 1998

Province/Territory	Collection and transportation	Disposal facilities	Recycling facilities	Organics processing facilities	Other	Total capital expenditures	
						1996	1998
							thousand dollars
Newfoundland	589	x	-	-	x	1 828	964
Prince Edward Island	x	x	-	-	-	x	x
Nova Scotia	x	x	229	x	374	14 416	x
New Brunswick	-	11 935	x	x	294	2 113	12 761
Quebec ²	4 574	24 268	3 980	1 014	2 219	6 851	36 054
Ontario	9 571	23 817	14 406	x	x	57 012	54 070
Manitoba	1 232	1 822	x	-	x	2 160	3 310
Saskatchewan	x	1 065	407	-	x	2 049	1 874
Alberta	2 280	8 261	889	x	x	13 308	16 891
British Columbia	5 477	9 481	1 136	x	x	11 187	16 901
Yukon and Northwest Territories ³	x	398	-	-	x	x	x
Canada	24 431	129 629	21 259	5 417	11 852	112 103	192 587

Notes:

Figures may not add up to totals due to rounding.

1. Includes capital expenditures that were made by local governments and other public organizations for waste management purposes.

2. Total capital expenditures are derived from a complementary survey conducted by Public Institutions Division. The expenditure breakdowns are imputed or are derived from administrative sources.

3. Includes Nunavut.

Sources:

Statistics Canada, Environment Accounts and Statistics Division and Public Institutions Division.

collected through the receipt of tipping fees from other local governments or private businesses. Among the provinces, only Alberta had a revenue source that surpassed tipping fees. In that province, utility bill payments comprised the largest share of waste management revenues. In Ontario, the sale of recyclable materials comprised 16% of the province's total. Only in Nova Scotia, where 12% of its revenues accrued from this source, was the sale of recyclable materials a significant component of a provincial revenue stream.

Table 4.5
Waste Management Revenue Sources for Local Governments by Province and Territory¹, 1998

Province/Territory	Utility bill payments	Contract revenues	Sale of recyclable materials	Tipping fees	Disposal facility royalties	Other revenues (bag tags, permits)	Total revenues	
							1996	1998
thousand dollars								
Newfoundland	39	x	x	2 490	x	x	1 977	2 640
Prince Edward Island	x	-	-	x	-	-	1 973	2 415
Nova Scotia	-	x	2 388	14 395	-	x	12 693	19 458
New Brunswick	x	-	x	22 612	-	496	8 371	23 889
Quebec ²	..	..	..	117 143	..	108 622	212 706	225 765
Ontario	4 062	12 055	28 437	106 682	4 637	23 234	182 928	179 106
Manitoba	243	175	1 299	4 174	x	x	10 597	6 007
Saskatchewan	2 808	1 039	350	3 927	948	243	7 240	9 316
Alberta	31 024	6 151	2 226	21 328	x	x	55 373	62 965
British Columbia	58 877	5 101	4 420	105 633	597	5 044	140 082	179 671
Yukon and Northwest Territories ³	1 454	-	x	x	-	-	2 464	1 545
Canada	100 285	24 882	39 806	399 392	7 245	141 169	636 714	712 778

Notes:

Figures may not add up to totals due to rounding.

1. Includes revenues collected specifically for waste management purposes by local governments and other public waste management organizations that provided waste management services in 1998. They do not include general municipal tax revenues.

2. Figures are derived from administrative sources.

3. Includes Nunavut.

Sources:

Statistics Canada, Environment Accounts and Statistics Division and Public Institutions Division.

4.3 Employment

Table 4.6 presents employment information for local governments and other public organizations that directly supplied waste management services in 1998. This sector directly employed 6 890 persons, 39% of whom were employed by local governments in Ontario. This total represents an 13% decrease from the 1996 totals. This is another indication of the move to privatized waste management service delivery.

By and large, employment in this industry was on a full-time basis, but exceptions to this trend are seen in Manitoba and Saskatchewan where 34% and 42% of the total employment was part-time.

Most people employed by local governments in the delivery of waste management services were involved in the operations of these services rather than in their administration or management (Table 4.7).

Table 4.6
Waste Management Employment by Local Governments¹ by Province and Territory, 1996 and 1998

Province/Territory	Full-time employees	Part-time employees	Total employees	
			1996 ²	1998 ²
number				
Newfoundland	87	35	164	122
Prince Edward Island	x	x	x	x
Nova Scotia	175	36	290	211
New Brunswick	108	29	128	137
Quebec ³	1 261	332	1 757	1 593
Ontario	2 365	324	2 960	2 689
Manitoba	213	111	549	324
Saskatchewan	182	134	310	316
Alberta	679	282	953	961
British Columbia	602	194	767	796
Yukon and Northwest Territories ⁴	x	x	x	x
Canada	5 717	1 173	7 924	6 890

Notes:

Figures may not add up to totals due to rounding.

1. Includes local governments, waste management boards and commissions and provincial bodies responsible for the delivery of waste management services.

2. Includes full-time and part-time employees working in the waste management activities of surveyed municipalities. No estimate has been made for non-surveyed municipalities.

3. Figures are derived from administrative sources.

4. Includes Nunavut.

Sources:

Statistics Canada, Environment Accounts and Statistics Division and Public Institutions Division.

Table 4.7
Waste Management Employment by Local Governments¹, by Function and by Province and Territory, 1998

Province/Territory	Full-time employees				Part-time employees				Total ² employees
	Administration and management			Total full-time employees	Administration and management			Total part-time employees	
	Operations	management	Other		Operations	management	Other		
number									
Newfoundland	72	x	x	87	x	x	-	35	122
Prince Edward Island	x	x	-	x	x	x	-	x	x
Nova Scotia	119	32	24	175	27	x	x	36	211
New Brunswick	73	x	x	108	22	x	x	29	137
Quebec ³	933	267	61	1 261	227	76	29	332	1 593
Ontario	1 683	555	127	2 365	211	78	35	324	2 689
Manitoba	177	22	14	213	75	24	12	111	324
Saskatchewan	152	x	x	182	98	x	x	134	316
Alberta	527	144	8	679	193	67	22	282	961
British Columbia	460	113	29	602	131	32	31	194	796
Yukon and Northwest Territories ⁴	x	x	-	x	x	x	-	x	x
Canada	4 229	1 212	276	5 717	802	267	104	1 173	6 890

Notes:

Figures may not add up to totals due to rounding.

1. Includes local governments, waste management boards and commissions and provincial bodies responsible for the delivery of waste management services.

2. Includes full-time and part-time employees working in the waste management activities of surveyed municipalities. No estimate has been made for non-surveyed municipalities.

3. Figures are derived from administrative sources.

4. Includes Nunavut.

Source:

Statistics Canada, Environment Accounts and Statistics Division and Public Institutions Division.

5 Survey Design and Methodology

5.1 Developing information on waste management

This section describes the design and methodology of the 1998 waste management industry surveys. It addresses the following areas: the survey universe, the procedures for data collection, editing, imputation and quality assurance.

The 1998 *Waste Management Industry Survey: Business Sector* asked firms to report information on their waste management activities for each of their provincial and territorial operations. Businesses were selected based on the size of their work force as well as the level of their total revenues. The threshold (based on revenue and employment levels) that was used to include or exclude a particular business from the survey mailout depended on the province or territory in which they operated. For example, surveyed businesses from Newfoundland had a lower revenue and employment cut-off than those from Ontario. For those firms not included in the survey because of their small size, administrative data on total operating revenues and total employment obtained from Statistics Canada's Business Register were used to estimate their contribution to the industry.

Surveyed local governments and other public waste management bodies were selected upon the basis of

population size and whether or not a disposal site operated within their jurisdiction. The 1998 *Waste Management Industry Survey: Government Sector* asked essentially the same questions as the business survey for the waste and recyclable quantities and types sections but differed somewhat on the financial questions.

To arrive at physical totals for the disposal and recycling sections, data from the two surveys were combined and duplicate entries were removed. These duplicates occur because operating arrangements of disposal and recycling activities can vary. Some sites may be owned by a government body but operated by a private firm. They may also be owned and operated by a government or by a private business. Since in some cases an owner of a facility may not have necessarily been the operator and the survey may have been completed by both the owner and the operator, care was taken to ensure that the information from each facility was only counted once on account of the point of measurement being the facility.

Not all of the population may have access to or use formal disposal or recycling facilities. In rural areas especially, arrangements can be made with a landowner to use property for the purpose of small-scale crude disposal sites ("dumps"). For this reason and others, a survey coverage population was developed using information provided by survey respondents and other sources about the municipalities that were served by disposal and recycling facilities.

Table 5.1
Survey Area Population (Disposal Data) as a Percentage of Total Provincial and Territorial Population, 1998

Province/Territory	Surveyed population	1998 Population	Surveyed population percentage of total provincial population	Population uncovered by survey
	number		percent	
Newfoundland	417 409	545 571	77	23
Prince Edward Island	69 207	137 005	51	49
Nova Scotia	925 307	936 174	99	1
New Brunswick	681 692	752 693	91	9
Quebec ¹	7 335 075	7 335 075	..	..
Ontario	10 764 025	11 414 303	94	6
Manitoba	968 332	1 138 113	85	15
Saskatchewan	732 960	1 025 671	71	29
Alberta	2 904 230	2 909 964	100	-
British Columbia	3 969 639	4 002 777	99	1
Yukon Territory	23 330	31 627	74	26
Northwest Territories ²	41 426	67 685	61	39
Canada	28 832 632	30 296 586	95	5

Notes:

1. Quebec local governments or other public waste management organizations were not surveyed. Information was collected from other sources and the population coverage is not known.

2. Includes Nunavut.

Sources:

Statistics Canada, Environment Accounts and Statistics Division.

Statistics Canada, CANSIM, matrices 6367-6379.

Total populations were calculated for these municipalities using Statistics Canada Census data. The difference between the Census population and the covered population was derived. A provincial per capita disposal figure was applied to this undercovered population, and this total was added to the survey total to arrive at an adjusted disposal figure.

While it is assumed that all Canadians produce waste and this waste must be disposed of in some manner—thus requiring a “blown-up” disposal figure—the same assumption cannot be made for recycling. Thus, the final recycling figures were not adjusted to account for undercoverage.

Table 5.1 shows the percentage of the population for each province that was not covered by the surveys and for which estimates were adjusted.

5.2 Survey universe

Business sector

The mailing list for the 1998 *Waste Management Industry Survey: Business Sector* was based on the 1996 survey frame supplemented and updated with information from the Statistics Canada Business Register (BR) and various industry directories. Firms selected from the BR are a subset of the Waste Management and Remediation Services NAICS 562 sector. The combined list was cross checked once more with other industry directories, to avoid double-surveying of units. This list produced an initial mailing of 824 survey units.

The survey system for waste management has evolved since the industry was first surveyed in 1989. The 1996 survey provided an excellent opportunity to refine the frame for the 1998 *Waste Management Industry Survey: Business Sector*. Many of the difficulties that were encountered in past surveys that drew their frames using the Standard Industrial Classification system (SIC 80) were overcome in 1998 with the adoption of the NAICS system of industry classification (Text Box 5.1).

During the survey process some businesses on the mailing list indicated that their major business rendered them out of scope for the survey. Many other firms had gone out of business or could not be located. After removing these firms, the survey was left with a population of 791 businesses.

Not included in the survey frame but included in the data for two variables (employment and total revenues) were firms that were excluded from the survey frame owing to their small size. These data, along with imputed data for total operating expenses and capital expenditures were added to

Text Box 5.1

The Classification of Waste Management Services

The North American Industry Classification System (NAICS) is an industry classification system developed by the statistical agencies of Canada, Mexico and the United States. Created against the background of the North American Free Trade Agreement, it is designed to provide common definitions of the industrial structure of the three countries and a common statistical framework to facilitate the analysis of the three economies. NAICS is based on supply side or production oriented principles, to ensure that industrial data, classified to NAICS, is suitable for the analysis of production-related issues such as industrial performance.

Businesses falling into the following NAICS classifications are considered to be “in scope” for the *Waste Management Industry Survey: Business Sector*.

56211 Waste Collection

This industry comprises establishments primarily engaged in collecting and hauling non-hazardous or hazardous waste within a local area. Establishments engaged in hazardous waste collection may be responsible for treating and packaging the waste for transport. Waste transfer stations are also included.

56221 Waste Treatment and Disposal

This industry comprises establishments primarily engaged in operating land fill sites, incinerators, or other treatment or disposal facilities for non-hazardous or hazardous waste. Establishments that integrate the collection, treatment and disposal of waste are also included.

56292 Material Recovery Facilities

This industry comprises establishments primarily engaged in operating facilities in which recyclable materials are removed from waste, or mixed recyclable materials are sorted into distinct categories and prepared for shipment.

Note that missing from this list of classifications is NAICS 56291, Remediation Services. While in the same NAICS grouping as the waste management industry, it does not currently fall into scope for survey purposes. This industry saw revenues of over \$315 million in 1998 and employed more than 2500 persons.

Source:

Statistics Canada, *NAICS Canada: Introduction*. <<http://www.statcan.ca/dissemination/english/Subjects/Standard/intro.htm>>, (accessed July 26, 1999).

the information obtained from the survey in order to provide a complete picture of the industry.

Government sector

The mailing list for the 1998 *Waste Management Industry Survey: Government Sector* was based on the past survey information, the 1998 Local Government Universe from Public Institutions Division and various waste industry lists and sources. Local governments are the most common level of government who manage waste. The Public Institutions Division list was supplemented with the names and addresses of other government bodies from provincial sources. This included, for example, regional waste management commissions and other similar agencies that were involved in the provision of waste management services.

Some provinces also collected data on aspects of waste management in 1998. These data were used to supplement missing values or to act as verification values against which the survey results were compared. Quebec municipalities, for example, were not surveyed because the province was responsible for collecting data.

All governments and government agencies on the final list were selected on the basis of a municipal population threshold that varied by province and whether there was a disposal facility (incinerator or landfill) within the borders of the municipality in 1998. A total of 782 surveys were mailed to respondents.

5.3 Data collection and processing

Data collection for both surveys took place during the spring and summer of 1998. Survey questionnaires were mailed to the businesses and local governments and the responses were returned by mail. The surveys were addressed to a contact person who was either responsible for, or had knowledge of, the waste management operations of the survey unit. Separate questionnaires were completed for each province in which the waste management business operated. For example, a business with operations in 3 provinces, completed 3 questionnaires—each one describing the activity(ies) within a province. This was not a concern for the local government survey.

Follow-ups by fax and/or telephone were carried out after the return due date to remind respondents to return their surveys.

Questionnaires were edited in two steps. First, validity edits were applied to ensure that responses to particular questions fell within a limited range of possible values. This type of editing was applied mostly to the questions on

quantities but was also used to identify unusual values in the financial sections. A second step, consistency edits, were then applied. These identified occasions where the responses in one section of the questionnaire were logically inconsistent with those given in other sections.

Additional follow-up with the businesses and local governments was carried out to collect missing data and to correct inconsistencies.

Government sector issues

Conducting the 1998 *Waste Management Industry Survey: Government Sector* proved to be challenging for several reasons.

First, many local governments use the services of private sector waste management firms. It was essential that both the questionnaire structure and particular wording enabled respondents to distinguish between services they provided with their own employees and those which they contracted out. In the processing phase it frequently became necessary to contact respondents to clarify the nature of these relationships.

A second more challenging aspect of the survey related to the way in which groups of municipalities work together to provide waste management services for their residents. In many areas, different tiers of local governments exist and governments in each tier may be involved in aspects of waste service delivery. Many alternative forms of service delivery were identified.

For example:

- 1) A regional government might serve an area within which there are a number of local municipalities.
- 2) The upper tier government might provide all of the waste services.
- 3) Only the lower tier municipalities might provide services.
- 4) Both tiers might provide different services (e.g., one operates a disposal facility, the other tier provides waste collection services).
- 5) Both tiers could be providing the same services to different parts of the region (a lower tier might run a disposal facility for just their municipality with the regional government running a disposal facility for the remainder of the region).
- 6) Municipalities in one or both tiers could act co-operatively through a separate government agency such as a regional waste commission that both collects waste and runs the disposal facility.

7) Or, none of the governments in an area could be doing any waste management, leaving provision of waste services strictly to private sector firms.

8) Or, there may be numerous combinations of the above scenarios.

Examples of each of these situations exist in Canada and both the survey vehicle and processing system had to be able to deal with these possibilities.

Extensive respondent follow-up was required in some cases. Returns for specific geographic areas were frequently processed together in order to build a clear picture of the service delivery area ("catchment area") and to prevent either double counting or inadvertently missing pieces of information.

5.4 Data quality

Many factors affect the quality of data produced in a survey. For example, respondents may have made errors in interpreting questions, answers may have been incorrectly entered on the questionnaires, and errors may have been introduced during the data capture or tabulation process. Every effort was made to reduce the occurrence of such errors in the survey. These efforts included: a complete verification of keyed data, validity and consistency edits, extensive follow-up with the large businesses, and consultation with selected government departments and industry associations.

In general, errors such as incomplete coverage of the universe, incorrect classification of business or government activity and inconsistencies in working definitions can be reduced if the survey is repeated at regular intervals and with sufficient frequency so that the mailing list is well maintained and the respondents are familiar with the definitions used and the type of information required.

Incomplete coverage of the industry universe occurs when a firm in the industry is overlooked. If the reason for not including the firm is that it has been incorrectly included in another industry, this is termed a classification error. Such errors have an impact upon estimates. However, these errors are less frequent now than in the past with the adoption of the NAICS classification system (See Text Box 5.1).

The large number of small firms in the waste management industry is a potential source for industrial classification errors. However, these businesses account for a comparatively small part of total industry activity. To some degree, these errors can be reduced by well designed questionnaires, by direct contact with respondents and with information from industry associations.

Although most businesses and local governments were very co-operative in answering the survey, some could not provide all the data required in the form in which it was requested. This was especially true for small firms and local governments responding to questions about the weights of material collected. Many of these businesses operate in areas where facilities do not have weigh scales or where waste volumes are tracked using liquid volume measurements. Therefore exact weights were not available; however many respondents were able to estimate the amounts handled based on the number of trips and the number and size of vehicles used. Another example of questionnaire difficulties was the breakdown of revenues by specific waste management activity. Many businesses and local governments, small and large, did not track their revenues in the manner that the survey required and left the component cells blank.

Imputation

In cases where values were missing from survey cells or cases where the respondent did not complete a questionnaire after extensive follow-up, information was imputed. For the business survey, both the firms with complete surveys and those with incomplete surveys were separated into three size groups, one with under 6 employees and another with 6 to 19 employees and the last with 20 and more employees. For financial and employment data, median cell values were calculated from the donor set (the complete surveys) separately for each firm size group. These values were then applied to the cells where a value was missing in the corresponding firm size group of the incomplete surveys. The rates of imputation for selected questions are presented in Table 5.2.

Very small firms (under 6 employees) were not intentionally included in the survey frame. The threshold for the surveyed and non-surveyed businesses was based upon previous years' and/or administrative data and the size of a business may change between the two reporting periods. For those small firms that were not surveyed, employment and financial data from the Statistics Canada Business Register

Table 5.2
Imputation Rates for Selected Questions from the Waste Management Industry Survey: Business Sector, 1998

Question	Under 6 employees ¹	6 or more employees	Total
	Imputation rate percent		
Financial characteristics			
Total operating revenue	5	2	2
Total operating expenditures	75	10	13
Capital expenditures	80	12	19

Note:

1. Firms with less than 6 employees were not surveyed. Therefore, there was a high rate of imputation for this size group.

Source:

Statistics Canada, Environment Accounts and Statistics Division.

were used as base level information from which other cells (e.g., operating expenses) were imputed. Thus, there is a very high rate of imputation for these very small businesses.

For the large firms, the imputed values were carefully scrutinised and compared with values from previous years and other sources (e.g., annual reports, security exchange filings) to ensure that the quality of the imputed values were high.

For the government sector survey, a very similar methodology was followed when estimating missing financial and employment values. But due to the very high response rate for this questionnaire (Text Box 5.2), very few values were of need of imputation.

Text Box 5.2

Response Rates

- *Waste Management Industry Survey; Business Sector, 1998*

Based on number of valid responses - 75%

Based on percentage of total revenue - 86%

- *Waste Management Industry Survey; Government Sector, 1998*

Based on number of valid responses - 90%

Based on percentage of total revenue - not applicable

Text Box 5.3

Response Burden

In order to better track and thus make adjustments to lessen the burden that the completion of these surveys imposes on respondents, the 1998 editions of the *Waste Management Industry Survey* asked respondents to indicate the amount of time spent on the completion of the questionnaire.

The mean number of hours reported by the respondents to both surveys is presented below:

Waste Management Industry Survey, Business Sector, 1998

- Under 20 employees - 1.03 hours
- Over 20 employees - 1.96 hours

Waste Management Industry Survey, Government Sector, 1998

- All respondents - 2.02 hours

Imputation for missing values in the disposal and recycling sections involved a different set of processes. First, the disposal and recycling sections of both the business sector and the government sector surveys were identical in design. This permitted an unduplicated matching of values for those facilities. Those facilities where, for example, a local government owned a landfill but contracted out the operation of the landfill, were removed to avoid counting the value of that facility twice. Next, values missing from one survey could be obtained from the other survey. To illustrate, a firm may have omitted the total quantity disposed of in a specific landfill that it operated, but the municipality that owned the landfill may have reported that value.

After as much information as possible could be gleaned from the completed survey forms, many of the missing values were obtained through an intensive period of follow-up through email or telephone calls. The remaining values were obtained from provincial and local government contacts, industry experts and publicly available sources such as the Internet.

The tables presented in this report cover the data that were determined to be of sufficient quality for publication at a disaggregated level. Data confidentiality considerations as well as imputation rates play a role in this assessment. Data must be released at a level where the disclosure of the identity of any respondent in any cell is not possible. In addition, the levels of imputation must remain within reasonable limits.

Data reliability

Table 5.3 presents relative measures of the reliability of specific data points contained in this Report. These measures are based on data quality and conceptual and methodological soundness. They are given the following ratings:

- class 1 - very reliable
- class 2 - reliable
- class 3 - acceptable

Data are considered to be "very reliable" (class 1) when they are characterized by the following:

- they are mainly derived from Statistics Canada surveys, or from other sources that are considered to be highly reliable; and
- are easily integrated into the tables without the need to correct for shortcomings in coverage (spatial, temporal, sectoral or environmental) or classification

and when they are characterized by concepts and methods that:

Table 5.3
Data Reliability Measures

Table	Variable	Classification
2.1	Disposal of Waste by Province and Territory, 1998	1, Quebec - 3
2.2	Non-hazardous Waste Disposal Site Characteristics by Province and Territory, 1998	1, Quebec - 3
2.3	Non-hazardous Waste Disposed of by Source and by Province and Territory, 1998	2, Quebec - 3
2.4	Materials Prepared for Recycling or Reuse by Type and by Province and Territory, 1998	1, Quebec - 3
2.5	Non-hazardous Materials Prepared for Recycling or Reuse by Source and by Province and Territory, 1998	2, Quebec - 3
2.6	Quantity of Municipal Solid Non-Hazardous Waste and Recyclable Materials Generated, by Source, by Province and Territory, 1998	2, Quebec - 3
2.7	Quantity of Municipal Solid Non-Hazardous Waste and Recyclable Materials Generated, Disposed of, and Diverted per Capita, all Sources, by Province and Territory, 1998	2, Quebec - 3
2.8	Quantity of Municipal Solid Non-Hazardous Waste and Recyclable Materials Generated, Disposed of, and Diverted per capita, Residential sources, by Province and Territory, 1998	2, Quebec - 3
Figure 2.1	Non-hazardous Waste Disposal and Diversion, Residential Sources, Selected Provinces, 1998	2, Quebec - 3
3.1	Waste Management Industry: Business Sector Characteristics by Province and Territory, 1998	1
3.2	Operating Revenues of Waste Management Businesses by Activity and by Province and Territory, 1998	1
3.3	Waste Collection and Transportation Activities of Businesses by Source of Revenue and by Province and Territory, 1998	1
3.4	Recyclables Collection and Transportation Activities of Businesses by Source of Revenue and by Province and Territory, 1998	1
3.5	Recyclables Preparation Activities of Businesses by Source of Revenue and by Province and Territory, 1998	1
3.6	Frequency of Waste Management Activities Conducted by Businesses and by Province and Territory, 1998	1
3.7	Number of Waste Management Activities Reported by Businesses by Province and Territory, 1998	1
3.8	Operating Expenditures of Waste Management Businesses by Type and Province and Territory, 1998	1
3.9	Capital Expenditures of Waste Management Businesses by Type and by Province and Territory, 1998	1
3.10	Employment by Waste Management Businesses and by Province and Territory, 1995, 1996 and 1998	1
3.11	Employment by Waste Management Businesses by Function and by Province and Territory, 1998	1
4.1	Local Government Current Expenditures on Waste Management by Activity and by Province and Territory, 1996 and 1998	1, Quebec - 2
4.2	Local Government Current Expenditures on Waste Management by Service Provider and by Province and Territory, 1998	1, Quebec - 2
4.3	Local Government Current Expenditures on Waste Management by Service Provider and Activity, 1994, 1996 and 1998	1, Quebec - 2
4.4	Capital Expenditures by Local Governments on Waste Management Services by Activity and by Province and Territory, 1998	1, Quebec - 2
4.5	Waste Management Revenue Sources for Local Governments by Province and Territory, 1998	1, Quebec - 2
4.6	Waste Management Employment by Local Governments and by Province and Territory, 1996 and 1998	1, Quebec - 2
4.7	Waste Management Employment by Local Governments, by Function and by Province and Territory, 1998	1, Quebec - 2

Source:
Statistics Canada, Environment Accounts and Statistics Division.

- are based on accepted environmental, economic or statistical theory
- do not require arbitrary or subjective decisions regarding important parameters
- are compatible with the concepts and methods used in the *Canadian System of National Accounts*, where applicable.

Data that meet all but one of the above criteria are deemed to be “reliable” (class 2). Those who fail to meet two or more of the criteria are deemed to be “acceptable” (class 3).¹

5.5 Waste generation and diversion calculations

As discussed in Section 2, this is the first year that Statistics Canada has published data on waste generation and diversion. For 1998, the high quality of the disposal and recycling data have allowed this new perspective to be calculated and published.

It is worthwhile reiterating, however, that while these data have been determined to be of high enough reliability and quality for publication, several cautions must be made. As stated in Section 2, inter-provincial comparisons with the province of Quebec are difficult because of the differences in methodologies used by Statistics Canada and the Province of Quebec. In addition, these data do not include many of the materials that were processed for reuse and resale (e.g., wholesale of scrap metals, used clothing). Finally, recycling and disposal activities undertaken as part of a firm's manufacturing process, an agricultural activity or as an on-site activity are also not part of these data.

5.6 Future and recent developments

NAPCS

Underway in 1999 were two projects that concern the future directions of the waste management industry surveys, both in the design of the survey forms themselves and in the way that data are reported.

The North American Product Classification System (NAPCS) initiative is a joint project undertaken by the statistical agencies of Canada, the United States and Mexico. An objective of the initiative is to improve the comparability of Canadian services product data with that of Mexico and the

1. Statistics Canada, 1997, *Econnections, Linking the Environment and the Economy, Indicators and Detailed Statistics, 1997*, Ottawa.

United States and to develop a demand-based product classification system, that is, one that groups products that are used together, are substitutes for one another or supply the same market. The long term objective of the joint initiative will be to develop a market-oriented/demand based classification system for products that (a) is not industry of origin based but can be linked to the NAICS industry structure, (b) is consistent across the three NAICS countries, and (c) promotes improvements in the identification and classification of service products across international classification systems, such as the Central Product Classification (CPC) of the United Nations.¹

When common products of the waste management industry are finalised and agreed upon by the three countries, future surveys may be modified in order to collect internationally comparable information.

General principles for calculating municipal solid waste system flows (GAP)

The GAP Team was formed on a voluntary basis in late 1999. The first meeting was held in December, 1999, and the members involved agreed to the proposed terms of reference for the group, and also a workplan which would be complete by summer, 2000.

The GAP process was undertaken because of a need to develop a common reporting framework which could be used by municipalities across Canada to report waste generation, diversion and disposal using consistent definitions concepts and reporting methods.

At this time, a Canada-wide standard approach used to calculate waste flows does not exist, and for this reason it is difficult to:

- develop accurate and verifiable waste quantities;
- compare one municipality with another;
- compare waste management system performance from one year to another;
- communicate results of waste diversion programs, and
- evaluate budget or grant proposals.

The need for a common basis of reporting and a consistent approach to waste measurement has been identified for some time. If nationally consistent methodologies can be developed, in addition to providing a method to address inter-municipality comparability, year to year comparisons can also be made.

The focus of the initial GAP work is to identify common reporting conventions for residential waste. This decision was made because it was felt that the most and highest quality information would be available for residential waste. Other waste sources will be dealt with at a future time, when the approach to residential waste has been defined.

As reporting standards are agreed upon, Statistics Canada's Waste Management Surveys will be revised in order to reflect and thus be in a position to realise benefits from this important initiative, in terms of higher quality data.

1. United Nations, 1998, *Central Product Classification (CPC) Version 1.0, Statistical Papers, Series M, No. 77. Ver. 1.0* Department of Economics and Social Affairs, Statistics Division, New York.



Environment Accounts and Statistics Division

Waste Management Industry Survey: Business Sector, 1998

Confidential when completed

Collected under authority of Statistics Act, Revised Statutes of Canada, 1985, Chapter S19.

Français au verso

Correct as required

Company Name

Operating Name

C/O

Street Address

City

Province/Territory

Postal Code



Please read before completing

Purpose of the Survey

This survey collects information that will help Canadians understand the contributions made by the waste management industry to Canada's economy and environment. The results will assist businesses in the industry to make sound decisions based on data that apply specifically to the waste management industry. Statistics Canada is also conducting a survey of government sector waste management for 1998. Together these surveys will provide a comprehensive picture of waste management in Canada.

Confidentiality

Statistics Canada is prohibited by law from publishing any statistics which would divulge information obtained from this survey that relates to any identifiable respondent, without their previous written consent. The data reported will be treated in strict confidence and used for statistical purposes only. The confidentiality provisions of the Statistics Act are not affected by either the Access to Information Act or any other legislation.

Authority

This survey is conducted under the authority of the Statistics Act, Revised Statutes of Canada, 1985, Chapter S19. **Completion of this questionnaire is a legal requirement under the Statistics Act.**

Inquiries

If you require assistance in completing this questionnaire or if you have any questions or comments regarding this survey, please contact:

**Operations and Integration Division
Statistics Canada
Ottawa, Ontario K1A 0T6**

Telephone (toll-free): **1-888-659-8229**

Fax: **1-800-755-5514**

Email: **enviro.oid.waste@statcan.ca**

In all correspondence concerning this questionnaire, please quote the identification number that appears on the address label.

IMPORTANT: If your response for an item is zero, please write "0" in the corresponding box rather than leaving the cell blank.

Where a response in dollars is requested, please answer in Canadian Dollars.

Please return this questionnaire within 30 days of receipt

If you are unable to do so, kindly inform Operations and Integration Division of the expected completion date.

Statistics Canada use only

Rec.	D	M	Y
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Ed.	D	M	Y
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Kyd.	D	M	Y
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Coll.	
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FSC	
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4-2200-1: 1999-02-01 STC/NAD-291-04165



Statistics Canada / Statistique Canada

Canada

SECTION 1

Business Type

1.1 This questionnaire should be completed for your company's operation in one province/territory only. If you operate in more than one province/territory, you should file **separate reports** for the other provinces/territories in which you operate. You may wish to photocopy this questionnaire or you may call us toll-free at 1-888-659-8229 to request additional questionnaires.

Province/territory for which this report applies

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

101

1.2 Did this company operate in more than one province/territory in 1998?

102 Yes
 103 No
 ➤ *Go to Question 1.4*

1.3 Please indicate the other provinces/territories in which you operate and for which you will be returning reports.

104 _____

1.4 Please indicate which of the following waste management activities this company provides in the province/territory indicated above.

Check all that apply

- 105 Collects and transports waste for disposal
 106 Collects and transports materials for recycling or reuse
 107 Operates a waste transfer facility
 108 Operates a landfill for non-hazardous waste
 109 Operates an incinerator for non-hazardous waste
 110 Treats/contains sewage
 111 Operates a hazardous waste treatment/disposal/containment facility
 112 Prepares material for recycling or reuse (sorting, cleaning and volume reduction)
 113 Other (Please specify) ➤ 114 _____

Reporting Period

1.5 Financial information should be reported for this company's most recent fiscal year ending at any time between April 1, 1998 and March 31, 1999.

Specify fiscal year Start: ¹¹⁵ _____ End: ¹¹⁶ _____

D M Y D M Y

Employment

1.6 Report the usual number of full-time (30 or more hours per week) and part-time (less than 30 hours per week) employees working for this company, according to their primary type of work.

	Number of employees	
	Full-time	Part-time
Operations (drivers, waste collectors, mechanics, etc.)	117	121
Administration and management	118	122
Other, specify ¹²⁵ _____	119	123
Total employees (sum cells 117 to 119 and cells 121 to 123)	120	124

SECTION 2

Operating Revenues

2.1 Indicate this company's 1998 revenue from the provision of each of the following services.

Collection and transportation of waste for disposal	201	\$
Collection and transportation of materials for recycling or reuse	202	\$
Operation of a waste transfer facility	203	\$
Preparing materials for recycling/reuse (e.g., sorting, cleaning, and volume reduction)	204	\$
Operation of a (non-hazardous) waste disposal facility (e.g., landfill or incinerator). Include tipping fees.	205	\$
Operation of a hazardous waste treatment, containment or disposal facility	206	\$
Sewage treatment/containment	207	\$
Other waste management revenue	208	
Specify ²¹²		\$
Sale of recovered materials	209	\$
Other non-waste management revenue	210	
Specify ²¹³		\$
Total revenues from all activities (sum cells 201 to 210)	211	\$

Operating Expenses

2.2 Please report this company's 1998 operating expenses.

Wages and salaries	214	\$
Employer contributions to pension, medical and unemployment insurance plans, etc.	215	\$
Fuel and electricity	216	\$
Other materials and supplies	217	\$
Maintenance and repairs	218	\$
Depreciation	219	\$
Tipping fees paid for waste disposal	220	\$
Operating licences and permits	221	\$
Other, specify ²²⁴	222	\$
Total expenses (sum cells 214 to 222)	223	\$

Capital Expenditures

2.3 Report this company's 1998 capital expenditures.


Include new assets purchased in Canada and all imported assets (new and used).

Vehicles	225	\$
All other machinery and equipment	226	\$
Construction and refurbishing of facilities (excluding residences)	227	\$
Maintenance and repairs of new and used assets	228	\$
Other, specify ²³¹	229	\$
Total expenditures (sum cells 225 to 229)	230	\$

SECTION 3

Collection, Transportation and Preparation


3.1 Did this company collect and/or transport waste for disposal in 1998?

³⁰¹ Yes ³⁰² No ➤ Go to Question 3.3


3.2 Report the percentage of this company's revenue from waste collection and transportation activities earned through contracts with the following in 1998.

Municipal/regional governments	303	%
Households (including contracts to serve apartments and condominiums)	304	%
Other industrial, commercial and institutional clients	305	%
Construction and/or demolition projects	306	%
Other (e.g., private individuals or community associations), <i>please specify</i> ³⁰⁸	307	%


3.3 Did this company collect and/or transport materials for recycling or reuse in 1998?

³⁰⁹ Yes ³¹⁰ No ➤ Go to Question 3.5


3.4 Report the percentage of this company's revenue from collection and/or transportation of materials intended for recycling or reuse earned through contracts with the following in 1998.

Municipal/regional governments	311	%
Households (including contracts to serve apartments and condominiums)	312	%
Other industrial, commercial and institutional clients	313	%
Construction and/or demolition projects	314	%
Other (e.g., private individuals or community associations), <i>please specify</i> ³¹⁶	315	%

3.5 Did this company prepare materials for recycling or reuse by sorting, baling, cleaning, reducing volume or preparing for shipment in 1998?

³¹⁷ Yes ³¹⁸ No ➤ Go to Question 4.1


3.6 Report the percentage of this company's revenue from the preparation of materials intended for recycling or reuse earned through contracts with the following in 1998.

Municipal/regional governments	319	%
Households (including contracts to serve apartments and condominiums)	320	%
Other industrial, commercial and institutional clients	321	%
Construction and/or demolition projects	322	%
Other (e.g., private individuals or community associations), <i>please specify</i> ³²⁴	323	%


SECTION 4

Waste Diversion

4.1 In 1998, did this company collect/transport materials for recycling or reuse?

AND/OR

Using a facility (e.g. MRF) that your company owned and/or operated, did your company prepare materials for recycling or reuse by sorting, baling, cleaning, reducing volume or preparing for shipment?

401 Yes 402 No ➤ Skip to Question 5.1


4.2 What quantities of the following materials did this company collect/transport and/or prepare for recycling or reuse in 1998?

	Collected/transported for recycling/reuse (tonnes)	Prepared for recycling/reuse (tonnes)
Newsprint, phone books, magazines	403	425
Corrugated cardboard and boxboard	404	426
Mixed paper fibre	405	427
Clear glass	406	428
Coloured glass	407	429
Ferrous metals	408	430
Copper	409	431
Aluminum	410	432
Other non-ferrous metals	411	433
Mixed metals	412	434
Whitegoods	413	435
PET plastic	414	436
Other plastics	415	437
Brick	416	438
Drywall	417	439
Mixed construction and demolition waste	418	440
Tires	419	441
Oils	420	442
Solvents or paints	421	443
Organic (compostables)	422	444
Other (please specify) ⁴⁴⁷	423	445
Total material collected/transported or prepared for recycling/reuse (sum cells 403 to 423 and 425 to 445)	424	446

SECTION 5

Exports of Non-hazardous and/or Hazardous Waste for Disposal or Materials for Recycling or Reuse

5.1 Did this company transport waste for disposal or materials for recycling or reuse to another province/territory or country in 1998?

(include direct shipments and shipments from transfer stations)

501 Yes 502 No ➤ *Skip to Question 6.1*

5.2 Check all that apply and indicate quantities transported

503 Transported to a facility in another province/territory

504 Transported to a facility in another country

Waste for disposal (tonnes)	Materials for Recycling/Reuse (tonnes)
505	507
506	508

5.3 Please identify the names and locations of all facilities (outside of the province/territory that you are reporting for) to which the (above) waste for disposal or materials for recycling or reuse were taken.

Waste	Recycling/ Reuse	Name of facility	Owner	Address
509 <input type="radio"/>	511 <input type="radio"/>	513	515	517
510 <input type="radio"/>	512 <input type="radio"/>	514	516	518

SECTION 6

Disposal Facilities for Non-hazardous Waste

6.1 Did this company operate a disposal facility for non-hazardous waste (landfill or incineration) in 1998?

601 Yes 602 No ➤ Skip to Question 7.1

6.2 For each disposal facility that you operated in the province/territory in 1998, indicate the name and location (street or highway address), type of facility and the amount of waste disposed of in the facility as measured by weigh scales or by providing your best estimate.

Name and address of disposal facility	Did you own or lease this facility? <i>(check if yes)</i>	Type <i>(check one only)</i>		Type of waste handled <i>(check all that apply)</i>			Weigh scale present? <i>(check if yes)</i>	Quantity of waste disposed of in the facility in 1998 (See definitions) (tonnes)
		Landfill	Incinerator	Municipal waste	Construction and demolition waste	Other		
603	607 <input type="radio"/>	611 <input type="radio"/>	615 <input type="radio"/>	619 <input type="radio"/>	623 <input type="radio"/>	627 <input type="radio"/>	631 <input type="radio"/>	635
604	608 <input type="radio"/>	612 <input type="radio"/>	616 <input type="radio"/>	620 <input type="radio"/>	624 <input type="radio"/>	628 <input type="radio"/>	632 <input type="radio"/>	636
605	609 <input type="radio"/>	613 <input type="radio"/>	617 <input type="radio"/>	621 <input type="radio"/>	625 <input type="radio"/>	629 <input type="radio"/>	633 <input type="radio"/>	637
606	610 <input type="radio"/>	614 <input type="radio"/>	618 <input type="radio"/>	622 <input type="radio"/>	626 <input type="radio"/>	630 <input type="radio"/>	634 <input type="radio"/>	638
Please provide information about any additional facilities on additional sheets (photocopy this form or telephone 1-888-659-8229 to obtain additional forms.)							Total	639

6.3 If you owned or leased a landfill, did it receive bottom ash from municipal solid waste or sewage sludge incineration?

640 Yes ➤
641 No

Quantity (tonnes)
642

6.4 Did your company own or operate a facility at which solid or liquid wastes (including hazardous) were converted to energy?

643 Yes ➤ If yes, how much waste did you convert to energy?
(please specify unit of measure, e.g., tonnes, litres, cubic metres)

Quantity of waste	Unit of measure
645	646

6.5 Were any of the following methods used to control/capture waste gases (e.g. methane) at a landfill owned or operated by your company?

Flaring _____ 647 Yes 650 No
 Draw off for use in energy production _____ 648 Yes 651 No
 Other _____ 649 Yes 652 No

(000s quantity cubic metres)
653
654
655

Imports of Waste

6.6 Was waste from outside this province/territory disposed of in this company's disposal facilities?

656 Yes 657 No

6.7 Check all that apply and indicate quantities disposed


658 Waste from other provinces/territories disposed of in your facility
 659 Waste from other countries disposed of in your facility

Quantity disposed (tonnes)
660
661

SECTION 7

Hazardous Waste Treatment and Disposal

7.1 Did this company operate a facility to treat, incinerate, or landfill (or otherwise contain) hazardous waste in 1998?

701 Yes 702 No ➤ Skip to Question 8.1


7.2 Did this company:

703 Own or lease the facility
 704 Operate the facility for another owner

7.3 What quantity of hazardous waste did this company treat or dispose of in 1998?

	Tonnes
Chemical treatment	705
Biological treatment (i.e.: use of micro-organisms (bioremediation) or use of plants (phytoremediation))	706
Incineration	707
Secure landfill	708
Other, <i>specify</i> ⁷¹¹	709
Total hazardous waste treated or disposed (sum cells 705 to 709)	710

7.4 What quantity of the following types of hazardous waste did this company treat or dispose of in 1998?

	Tonnes
Organic solvents, solutions and still bottoms	712
Oils and greases, oily mixtures and residues	713
Heavy metal solutions and residuals	714
Inorganic sludges, solutions and residues	715
Pesticide and herbicide wastes	716
PCB wastes	717
Other (miscellaneous chemicals, paint, biomedical waste etc.)	718
Total hazardous waste treated or disposed (should equal sum in Question 7.3)	719

SECTION 8

Disposal of Contaminated Soil

(answer only if you owned or leased a landfill)

8.1 Did your landfill(s) receive contaminated soil?

801 Yes ➤

Quantity (tonnes)
803

802 No

8.2 If yes, was this amount included in your response to question 6.2 or question 7.3?

804 Yes

805 No

Certification

I certify that the information contained in this report is correct and complete to the best of my knowledge.

Signature



Date

Day Month Year

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Name of person completing this report

Telephone

--	--	--	--	--	--	--	--	--	--

Title of person completing this report

Fax

--	--	--	--	--	--	--	--	--	--

Email Address

Answer only if you own or operate a disposal or recycling facility:

In order to provide Canadians with accurate and detailed information about disposal and recycling facilities, Statistics Canada may wish to release the locations of these facilities as well as whether these facilities are privately or publicly owned or operated.

Do you consent to the release of this information?

806 Yes

807 No

Signature



Title

Date

Day Month Year

--	--	--	--	--	--	--	--	--	--

Comments

Approximately how long did it take you and other employees in your company to collect the data and complete this survey?

Hours

In the future, would you prefer to receive this survey in an electronic format?

809 Yes ➤ If yes, please provide your email address
810 No

If you have any questions, please contact us.
Telephone (toll free) 1-888-659-8229
Fax: 1-800-755-5514
Email: enviro.oid.waste@statcan.ca

Please return this
questionnaire in the
envelope provided

Thank you for your cooperation !



Environment Accounts and Statistics Division

Waste Management Industry Survey: Government Sector, 1998

Confidential when completed

Collected under authority of Statistics Act, Revised Statutes of Canada, 1985, Chapter S19.

Français au verso

Correct as required

Government Name

C/O

Street Address

City

Province/Territory

Postal Code



Please read before completing

Purpose of the Survey

This survey collects information that will help Canadians understand the role of governments in waste management, as well as the impact of such activity on Canada's economy and environment. Statistics Canada is also conducting a survey of private waste management for 1998. Together these surveys will provide a comprehensive picture of waste management in Canada.

Confidentiality

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**Operations and Integration Division
Statistics Canada
Ottawa, Ontario K1A 0T6**

Telephone (toll-free): **1-888-659-8157**
Fax: **1-800-755-5514**
Email: **enviro.oid.localgovt@statcan.ca**

In all correspondence concerning this questionnaire, please quote the identification number that appears on the address label.

Reporting Period

Report for the calendar year 1998.

General Instructions

This survey is intended for the jurisdiction responsible for the operation of the waste management programme.

The term "jurisdiction" is used to represent any government or government agency.

If your jurisdiction is an association of municipalities, an upper tier or a special organization with a mandate to manage waste for a number of lower-tier governments then please respond for the municipalities under your jurisdiction. All references in the questionnaire to **your jurisdiction** should be interpreted as all municipalities under your jurisdiction. Please provide a list of member municipalities.

If you represent a lower-tier government and you do not maintain statistics on any of the functions covered by this questionnaire, please tell us who we may contact to obtain this information.

If your jurisdiction can only report some of the data required, please tell us who we might contact to obtain the missing information.

There are 5 sections to this survey. In some cases provincial sources will provide the data we require. Please answer all sections of this survey unless we advise you to do otherwise.

If your municipality does not collect data in metric tonnes please convert quantities (truck loads, pounds, etc.) to metric tonnes. Estimate if necessary.

IMPORTANT: If your response for an item is zero, please write "0" in the corresponding box rather than leaving the cell blank.

Please return this questionnaire within 30 days of receipt

If you are unable to do so, kindly inform Operations and Integration Division of the expected completion date.

Statistics Canada use only

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4-2200-5: 1999-02-01 STC/NAD-291-04478

Definitions

Waste for disposal

Included in this category are materials, products or by-products for which the waste generator has no further use and which are received for disposal at waste disposal facilities (**This does not include materials destined for recycling**).

- Included:**
- municipal solid waste
 - construction and demolition waste
 - sewage sludge, septage and bottom ash from sewage incineration

- Excluded:**
- wastes that are associated with primary resource extraction or harvesting (eg. farm manure, fish waste from fish processing, market garden waste, orchard and urban forest tree prunings, mine or mill tailings, forest industry waste)
 - conventional air pollutants
 - liquid effluents from processing or manufacturing sites
 - any materials used as landfill cover
 - clean or contaminated soil including soil used as landfill cover
 - industrial sludge
 - gravel and rocks
 - by-products generically referred to as nuclear wastes and hazardous wastes
 - wastes that enter the facility but that are ultimately recycled, composted or used as cover

This definition is consistent with the definition of waste used by the Canadian Council of Ministers of the Environment.

Waste disposal facility

An establishment for the handling of solid waste for final disposal. Waste disposal facilities options include landfilling and incineration.

Municipal solid waste

Municipal solid waste includes solid waste produced by the residential and the industrial, commercial and institutional sectors and excludes construction and demolition waste.

Residential waste

Includes waste material from residential dwellings, including apartment buildings and condominiums.

Industrial, commercial and institutional waste

Includes waste material from sources such as heavy and light industry, manufacturing, warehousing, transportation, retail and wholesale commercial activities, restaurants, offices, educational or recreational facilities, health and other service facilities.

Construction and demolition waste

Includes waste material from the construction, demolition and renovation of buildings, bridges, roads and ports, and from land clearing of previously developed areas. Excludes materials from land clearing on areas not previously developed.

List all municipalities, cities, villages, towns and townships for which you are responding.

City / Municipality	Financial and employment section	Disposal facilities section	Other sections
1.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SECTION 1

Collection, Transportation and Preparation

1.1 Was a programme to collect and transport waste for *disposal* administered by this jurisdiction in 1998?

101 Yes 102 No ➤ Go to Question 1.4



1.2 If yes, who collected the waste? (Check all that apply.)

103 This jurisdiction's employees

104 Contractor(s) hired by this jurisdiction
(please specify
name(s) of
contractor(s)) ➤

105 _____

106 Other (please specify) ➤

107 _____

1.3 Indicate the sources of wastes collected/transported by your jurisdiction's employees.

108 Residential 109 Industrial, Commercial and Institutional 110 Construction and Demolition

1.4 Was a programme to collect/transport materials for *recycling or reuse* administered by this jurisdiction in 1998?

111 Yes 112 No ➤ Go to Question 1.7



1.5 If yes, who collected the materials? (Check all that apply.)

113 This jurisdiction's employees

114 Contractor(s) hired by this jurisdiction
(please specify
name(s) of
contractor(s)) ➤

115 _____

116 Other (please specify) ➤

117 _____

1.6 Indicate the sources of materials for recycling or reuse collected/transported by your jurisdiction's employees

118 Residential 119 Industrial, Commercial and Institutional 120 Construction and Demolition

1.7 In 1998, did this jurisdiction, on its own or in collaboration with other jurisdictions, own and/or operate a facility(ies) that *prepared materials for recycling or reuse* by sorting, baling, cleaning, reducing volume or preparing for shipment? (e.g. MRFs)

121 Yes 122 No ➤ Go to Question 2.1



1.8 Did you . . .

123 Own **and/or** 124 Operate this facility(ies)? (check one or both)

125 Operator of
facility(ies) if not self ➤

126 _____

1.9 Indicate the sources of materials intended for recycling or reuse prepared at this facility in 1998.

127 Residential 128 Industrial, Commercial and Institutional 129 Construction and Demolition


SECTION 2

Waste Diversion

2.1 In 1998, did your jurisdiction's employees collect/transport materials for recycling or reuse?

AND/OR

Using a facility (e.g. MRF) that your jurisdiction owned and/or operated, did your jurisdiction's employees prepare materials for recycling or reuse by sorting, baling, cleaning, reducing volume or preparing for shipment?

201 Yes 202 No ➤ Go to Question 3.1


2.2 What quantities of the following materials were collected/transported and/or prepared for recycling or reuse?

	Collected/transported for recycling/reuse (tonnes)	Prepared for recycling/reuse (tonnes)
Newsprint, phone books, magazines	203	225
Corrugated cardboard and boxboard	204	226
Mixed paper fibre	205	227
Clear glass	206	228
Coloured glass	207	229
Ferrous metals	208	230
Copper	209	231
Aluminum	210	232
Other non-ferrous metals	211	233
Mixed metals	212	234
Whitegoods	213	235
PET plastic	214	236
Other plastics	215	237
Brick	216	238
Drywall	217	239
Mixed construction and demolition waste	218	240
Tires	219	241
Oils	220	242
Solvents or paints	221	243
Organic (compostables)	222	244
Other (please specify) ²⁴⁷	223	245
Total material collected/transported or prepared for recycling/reuse (sum above cells)	224	246

SECTION 3

Exports of Waste for Disposal or Materials for Recycling or Reuse

3.1 In 1998, did this jurisdiction's *own employees* transport waste for disposal or materials for recycling or reuse to another jurisdiction, province/territory or country?
(include direct shipments and shipments from transfer stations)

301 Yes
 302 No ➤ Skip to Question 4.1

3.2 Check all that apply and indicate quantities transported

	Waste for disposal (tonnes)	Materials for Recycling/Reuse (tonnes)
303 <input type="radio"/> Transported to a facility in another jurisdiction	306	309
304 <input type="radio"/> Transported to a facility in another province/territory	307	310
305 <input type="radio"/> Transported to a facility in another country	308	311

3.3 Please identify the name and location of all facilities to which the (above) waste for disposal or materials for recycling or reuse were taken outside your jurisdiction.

Waste	Recycling/ Reuse	Name of facility	Owner	Address
312 <input type="radio"/>	314 <input type="radio"/>	316	318	320
313 <input type="radio"/>	315 <input type="radio"/>	317	319	321

SECTION 4

Disposal Facilities

4.1 Did your jurisdiction own or operate a solid or liquid waste disposal facility in 1998?

401 Yes 402 No ➤ Skip to Section 5

4.2 For each disposal facility that you owned (or leased) in 1998, indicate the name and location (street or highway address), the operator if not self, type of facility and the amount of waste disposed in the facility as measured by weigh scales or by providing your best estimate.

Name and address of disposal facility	Operator of facility if not self	Type (check one only)		Type of waste handled (check all that apply)			Weigh scale present? (check if yes)	Quantity of waste disposed in the facility in 1998 (tonnes) (See definitions)
		Landfill	Incinerator	Municipal waste	Construction and demolition waste	Other		
403	408	413 <input type="radio"/>	418 <input type="radio"/>	423 <input type="radio"/>	428 <input type="radio"/>	433 <input type="radio"/>	438 <input type="radio"/>	443
404	409	414 <input type="radio"/>	419 <input type="radio"/>	424 <input type="radio"/>	429 <input type="radio"/>	434 <input type="radio"/>	439 <input type="radio"/>	444
405	410	415 <input type="radio"/>	420 <input type="radio"/>	425 <input type="radio"/>	430 <input type="radio"/>	435 <input type="radio"/>	440 <input type="radio"/>	445
406	411	416 <input type="radio"/>	421 <input type="radio"/>	426 <input type="radio"/>	431 <input type="radio"/>	436 <input type="radio"/>	441 <input type="radio"/>	446
407	412	417 <input type="radio"/>	422 <input type="radio"/>	427 <input type="radio"/>	432 <input type="radio"/>	437 <input type="radio"/>	442 <input type="radio"/>	447
Please provide information about any additional facilities on additional sheets (photocopy this form or telephone 1-888-659-8157 to obtain additional forms.)								448
Total								

4.3 If you owned or leased a landfill, did it receive bottom ash from municipal solid waste or sewage sludge incineration?

449 Yes ➤

Quantity (tonnes)
451

450 No

4.4 Did your jurisdiction own or operate a facility at which solid or liquid wastes (including hazardous) were converted to energy?

452 Yes ➤ If yes, how much waste did you convert to energy? (please specify unit of measure, e.g., tonnes, litres, cubic metres)
453 No

Quantity of waste
454

Unit of measure
455

4.5 Were any of the following methods used to control/capture waste gases at a landfill owned or operated by your jurisdiction?

Flaring Yes 456 Yes 459 No
Draw off for use in energy production Yes 457 Yes 460 No
Other Yes 458 Yes 461 No

(000's quantity cubic metres)
462
463
464

Imports of Waste

4.6 Did other jurisdictions dispose of their waste in your disposal facilities?

465 Yes 466 No ➤ Skip to Section 5

(please list them)

467	468	469	470
-----	-----	-----	-----

(Use Comments section if you require more space)

Check all that apply and indicate quantities disposed

471 Waste from other jurisdictions in your province/territory disposed in your facility
472 Waste from other provinces/territories disposed in your facility
473 Waste from other countries disposed in your facility

Quantity disposed (tonnes)
474
475
476

SECTION 5

Finance

5.1 Revenues from Waste Management Services Not Funded from Tax Revenues.

	Dollars
Revenues from utility bill payments (for waste management services)	501
Revenues from provision of waste management services to business on contract	502
Revenues from sale of recyclable materials	503
Revenues from tipping fees at disposal facilities	504
Royalties received for hosting a waste disposal facility	505
Other non-tax revenues for waste management (eg. sale of bag tags, other collection permits)	506
Total revenues from waste management services	507

5.2 Operating Expenditures

(Include all operating and administrative expenditures related to waste management and do not net out revenue)

	In-house expenses (Dollars)	Payments to waste management firms (Dollars)	Payments to other governments (Dollars)
Collection and transport of waste, recyclables and organics	508	515	522
Tipping fees	509	516	523
Operation of disposal facilities	510	517	524
Operation of recycling facilities	511	518	525
Operation of organics processing facilities	512	519	526
Other	513	520	527
Total operating expenditures	514	521	528

5.3 Capital Expenditures

	Dollars
Collection	529
Disposal facilities	530
Recycling facilities	531
Organics processing facilities	532
Other	533
Total capital expenditures	534


Employment

5.4 Report the usual number of full-time (30 or more hours per week) and part-time (less than 30 hours per week) employees working in the waste management activities of your jurisdiction, according to their primary type of work.
(Do not include contractor's employees)

	Number of employees	
	Full-time	Part-time
Operations (e.g., drivers, waste collectors, mechanics, etc.)	535	539
Administration and management	536	540
Other (please specify) ⁵⁴³	537	541
Total	538	542

Certification

I certify that the information contained in this report is correct and complete to the best of my knowledge.

Signature 	Date Day Month Year <table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>																					
Name of person completing this report	Telephone <table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>																					
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Answer only if you own or operate a disposal or recycling facility:

In order to provide Canadians with accurate and detailed information about disposal and recycling facilities, Statistics Canada may wish to release the locations of these facilities as well as whether these facilities are privately or publicly owned or operated.

Do you consent to the release of this information?

⁵⁴⁴ Yes

⁵⁴⁵ No

Signature 	Title	Date Day Month Year <table border="1"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										

Comments

Approximately how long did it take you and other employees in your jurisdiction to collect the data and complete this survey?

Hours

In the future, would you prefer to receive this survey in an electronic format?

⁵⁴⁷ Yes ➤ If yes, please provide your email address
⁵⁴⁸ No

If you have any questions, please contact us.
Telephone (toll free) 1-888-659-8157
Fax: 1-800-755-5514
Email: enviro.oid.localgovt@statcan.ca

Please return this questionnaire in the envelope provided

Thank you for your cooperation !